Development of Primary School Teachers' Competences in Promoting a Healthy Lifestyle and Well-Being in Children Aged 6 to 12

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Abstract Primary school teachers are one of the largest professional groups in education. Their competences cover a wide range of knowledge, abilities, and skills. However, the curricula for teacher education rarely contain topics related to children's health and lifestyle. The purpose of this study was to gain an insight into the role of primary school teachers in supporting a healthy lifestyle and the well-being of children. A systematic literature review with meta-analysis was implemented on a sample of N = 37 studies. The results showed that teachers have a significant role in strengthening physical and mental health in schoolchildren aged between 6 to 12. School-based mental health promotion programs were statistically significantly more often implemented by primary school teachers undergoing special training for program implementation (p = .025). In their early school years, children are susceptible to establishing a long-term healthy lifestyle. Hence, the development of health promotion competences should be a priority in the curriculum of teacher education.

Keywords:
elementary school, health promotion, health education, subject didactics, teacher education

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1 Introduction

As one of the fundamental human rights every child in Slovenia has the right to preventive health care (Uradni list RS, št. 19/98). Studies have proved that children with better health achieve better academic outcomes and better health in later life (Langford et al., 2015). Even short health promotion programs within the regular school curriculum could benefit the schoolchildren's physical and mental health (Volanen et al., 2020) and their cognitive and academic performance (Singh et al., 2017). Several Cochrane reviews have published findings of some of the most prevalent areas of health promotion in schools, such as encouragement to regular physical activity and improvement of physical fitness (Dobbins et al., 2013; Demetriou et al., 2015; Schüller, & Demetriou, 2018), dietary behaviour (Racey et al., 2016), preventing substance use (Carney et al., 2016; Thomas et al., 2013), mental health awareness (Salerno, 2016), and prevention of unintended pregnancies (Oringanje et al., 2016).

Undoubtedly, school settings play a crucial role in protecting and encouraging healthy development in the school-aged population. However, there is still a substantial gap in studies to assess the impact of health promotion programs on health-related outcomes in schoolchildren (Singh et al., 2017). Moreover, the curricula of teacher education globally rarely contain topics related to children's health and lifestyle. Therefore, the purpose of this study was to gain an insight into the health promotion programs provided by a primary school teacher during the early years of a child's schooling.

1.1 Health Education and Health Promotion in the School Setting

Health education and health promotion for children and young people have a long tradition worldwide, especially in Japan (Yamauchi et al., 2019) and Finland (Laaksonen, 2012). In Japan, a "Yogo teacher" is defined as "a special licensed educator who supports children's growth and development through health education and health services on the basis of principles of health promotion in all areas of educational activities in school" (Yamauchi et al., 2019, p. 81). A Yogo teacher is considered teaching staff, not necessarily a health professional, who undergoes a university education offered by various institutions, such as teaching

education, health sciences education, physical, or nutrition education (Yamauchi et al., 2019).

On the other hand, a school nurse in Finland is defined as "a public health nurse that provides preventive and curative health care services to schoolchildren" (Laaksonen, 2012, p. 25). The Finnish concept of school nursing is grounded on the priorities of check-ups for children's growth and development, screening for infectious diseases, and physical health. From this point of view, the Finish concept is closely related to the Slovenian concept of preventive health care defined by the national Rules on Carrying out Preventive Health Care at the Primary Level (Uradni list RS, št. 19/98).

The main purpose of the ZDAJ – Zdravje danes za jutri [engl. NOW – Health Today for Tomorrow] program, as the core preventive health care program for children, adolescents, and students in Slovenia, is dominantly oriented towards health protection, reducing mortality, morbidity, and disability, and to the monitoring of children's and young people's health. Preventive medical examinations with screening for early assessment of risks are in the foreground. Consequently, the only providers of the ZDAJ program are medical institutions, physicians, registered nurses, and other health-related professionals (e.g., clinical psychologists, speech therapists) (Uradni list RS, št. 19/98). Unfortunately, the regulations do not include teachers in schools, where a significant part of a child's health experience occurs. Hence, the role of pedagogical science and practice should be carefully studied and considered.

1.2 Teachers' Education for Promoting a Healthy Lifestyle and Well-Being in Slovenian Children

At the beginning of the 1990s, the Faculty of Education and the College of Health at the University of Ljubljana offered the first university degree in health education. The program followed a two-year college education in nursing and comprised four semesters with 15 different courses, integrating educational and health sciences. In the curriculum, emphasis was placed on nursing (215 hours[1]), education for health (120 hours), research methodology (150 hours), and management in nursing (145

[1] All hours are teaching hours. One teaching hour is 45 minutes.

hours) (Pahor, 1998). Although the international strategies for health promotion, quality of life, and longevity initiated the degree program in health education at the University of Ljubljana (Pahor, 1998), it seems that more substantial reasons originated from the lack of nursing education. The nursing society tried to develop a university degree in nursing and not a particular education program for professionals in promoting better health in schools. It is suggested that this was one of the significant reasons that the study program was offered only for four academic years.

Despite its short period of running, the Slovenian study program in Health Education had a significant impact on the education of teachers, specialised in promoting a healthy lifestyle and wellbeing in schools and healthcare. Among the first professors of the program, Kališnik (2003) emphasized that health education requires professionals with a university education, who successfully integrate knowledge in healthcare and pedagogy.

The first generation of graduates[2] was evaluated by Pahor (1998). She used a mixed methods triangulation approach with a quantitative survey (n = 49) and qualitative interviews (n = 34). The cohort was observed three times: at the beginning of their studies, at the beginning of their second year, and at the end of their studies. Pahor (1998) reported that most students participated in the program part-time. Therefore, balancing a job, school, and family obligations was the main struggle for the participants. The participants highlighted appreciation for the study program, which helped them in the areas of personal development, self-confidence, empathy to themselves and others, greater tolerance, a sense of responsibility, and critical thinking. Ten years after enrolment, Kališnik (2003) repeated the survey on the same group. The graduates still expressed a strong belief in their study program from the broader sense of knowledge and encouragement for lifelong education. They expressed regrets related to the discontinuation of the study program and a strong need for systematisation and recognition of their profession in the Slovenian health and school system. In his work, Kališnik (2003) mentioned the new curriculum for health education, intended to be run in the early 2000s. However, the study of health education so far has not been revived. Therefore, the issue of teachers' competences

[2] Enrolled in the 1993/1994 academic year.

for promoting a healthy lifestyle and well-being in children remains in need of new systematic research.

1.3 The Purpose of the Study

Following this research gap, the study aimed to evaluate school health promotion programs for students aged between 6 to 12. All analysed programs were implemented by their class teachers and/or changes in the school curriculum. Of primary interest were the main characteristics of the programs, e.g., area of health, methodology, target groups, duration, and follow-ups. Second was an evaluation of the effectiveness of the programs on children's health. Lastly, the differences according to the provider and school grade were statistically analysed.

2 Systematic Literature Review

A systematic literature review with a meta-analysis approach based on the classification of the review types by Sutton, Clowes, Preston & Booth (2019) was implemented. The literature review was conducted in the following three stages: 1) Collecting data from peer reviewed journals; 2) Evaluating the obtained data based on the inclusion and exclusion criteria, and 3) Analysing the data with statistical methods.

2.1 Methodology

The EBSCOhost and PubMed databases were selected for a systematic literature search. PubMed included a high level of publications based on randomized controlled trials (RCT), and publications on school-based interventions were strongly represented on EBSCOhost.

The first data search resulted in 854 articles. After careful evaluation of the collected articles through the inclusion and exclusion criteria (Table 1), the final sample of 37 studies was selected for the literature review.

Table 1. Inclusion and exclusion criteria for the systematic literature review

Category	Inclusion criteria	Exclusion criteria
Area	health-related programs	learning difficulties, problem behaviour; topics unrelated to health
Target group	primary school children, aged 6 to 12; general population	children not within the age limit; children with special needs or chronic conditions
Settings	primary schools	programs in healthcare, the community, research institutes, other organisations
Provider	primary school teachers	external experts (e.g., health professionals, dietitians, kinesiologists, psychologists)
Results	reporting the effects of the program on the child's health	screen studies; evaluations; interventions without results on health effects
Type of article	research article, completed study with methods, results and a discussion	study protocols, review papers, conference proceedings, PhD dissertations, grey literature
Language	English language, available full text	other languages, abstracts
Database search	EBSCOhost, PubMed	other bibliographical databases, other sources

Table 2: Methodology of the school-based health promotion programs included in the review

Methodology		n	%
Research design	Randomized controlled trial	22	59.5
	Quasi-experimental design	5	13.5
	Pretest-posttest design	3	8.1
	Controlled intervention	7	18.9
Country of the HPP implementation	United Kingdom	7	18.9
	USA	5	13.5
	Germany	4	10.8
	Switzerland	3	8.1
	Australia	3	8.1
	China	2	5.4
	Denmark	2	5.4
	Pakistan	2	5.4
	Others	9	24.4

Legend: HPP – health promotion program.

Table 2 shows the methodological characteristics of the school-based health promotion programs included in the systematic review (n = 37). The school-based health promotion programs were implemented around the globe. However, 59.4% of the reviewed programs were implemented in Western countries. Moreover, almost two-thirds of the programs (59.5%) were implemented by RCT design, which is recognized as level 1 or the highest-quality level of scientific evidence and "may be given the greatest weight when determining the impact, the results should have

on practice" (DeVries, & Berlet, 2010, p. 207). Similarly, the quasi-experimental and controlled interventions were evaluated on methodological levels 2 and 3 as high quality and reliable scientific evidence.

Meta-analysis of the reviewed articles was conducted using statistical methods, such as descriptive statistics for attributive variables (frequency, percentage) and numerical variables (mean, standard deviation). Owing to the data being unevenly distributed, a nonparametric Mann-Whitney U test and Cramer's V test were used. Cramer's V replaced a measurement from the chi-square test when conditions for analysis were not satisfied (more than 20% of cells had expected a count of less than five, and the minimum expected count was lower than 1.00). All statistical analyses were implemented in IMB SPSS Statistics, version 28.0.

2.2 Results of the Meta-Analysis

Fifteen different areas of health promotion were recognized within 37 school-based health promotion programs included in the review (Figure 1). The most popular were interventions promoting a healthy lifestyle, such as a balanced diet and regular physical activity (37.8%). They were followed by programs attempting to prevent cardiovascular disease, e.g., metabolic syndrome, obesity, high blood pressure, anaemia (21.6%). Other prevalent programs focused on mental health promotion, including quality of sleeping and substance abuse prevention (18.9%) and infection control programs (8.1%). Overall, they covered a wide range of areas of health, such as oral health promotion, fall or injury prevention, and improving overall growth and physical fitness.

Table 3 presents the main characteristics of the school-based health promotion programs. Most of them (64.9%) were provided within the regular school curriculum or because of changes in school policy. Only 35.1% of them reported special training and teaching material for teachers who delivered the programs.

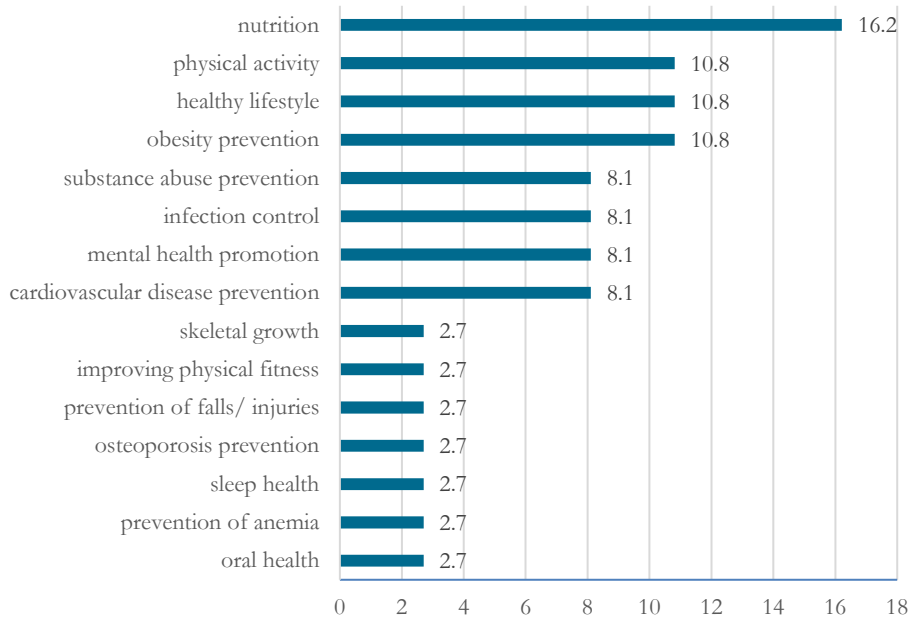

Figure 1. Areas of school-based health promotion programs.

Source: own

Table 3: Methodology of the school-based health promotion programs included in the review

Characteristics		**n**	**%**
Program provider	Changes in school curriculum	24	64.9
	Specially trained teachers	13	35.1
Area of health	Physical health	30	81.1
	Mental health	7	18.9
Target group	Children	31	86.5
	Children and families	1	2.7
	Children and teachers/school	3	8.1
	Children, families, and school	1	2.7
Participants' grade level	1st grade (6.5–7.0 years)	2	5.5
	2nd grade (7.5–8.0 years)	6	16.2
	3rd grade (8.5–9.0 years)	8	21.6
	4th grade (9.5–10.0 years)	7	18.9
	5th grade (10.5–11.0 years)	8	21.6
	6th grade (11.5–12.5 years)	6	16.2
		Mean	**SD**
HPP duration (months)		12.2	13.7
Number of follow-ups		1.68	1.25
Time of the first follow-up (months after HPP)		7.78	12.02
Time of the last follow-up (months after HPP)		14.46	16.87

Legend: SD – standard deviation; HPP – health promotion program.

Of the analysed school-based health promotion programs, 81.1% were dedicated to promoting physical aspects of health and 86.5% of them targeted merely children. Most of the programs were implemented in the 3rd and 5th grades of primary school. However, there was a balanced implementation of programs between the 1st (43.3%) and the 2nd (56.7%) educational cycles of primary school.

The numerical variables in Table 3 show that an average school-based health promotion program was carried out for about one year, with at least 1 or 2 follow-ups after the cessation of the program. The first follow up, which measured the health promotion program's effects on children's health, took place around eight months after the intervention, and the last follow up more than one year after the intervention. However, all numerical characteristics of the health promotion programs showed a high standard deviation reflecting a wide range of durations and follow-ups in the analysed health promotion programs in primary schools. The authors were also interested in any statistically significant differences in characteristics of the school-based health promotion programs relating to their providers and participants' grade levels (Table 4).

Table 4: Differences in characteristics of school-based health promotion programs according to provider and school grade

HPP Characteristics	HPP provider*	School grade**
	Cramer's V (p)	**Cramer's V (p)**
Area of health	**.367 (.025)**	.004 (.982)
Target group	.255 (.494)	.417 (.092)
Research design	.074 (.977)	.071 (.980)
	Mann-Whitney U test (p)	**Mann-Whitney U test (p)**
HPP duration (months)	155.000 (.975)	1.500 (.129)
Number of follow-ups	148.500 (.778)	3.000 (.248)
Time of the first follow-up (months after HPP)	135.500 (.499)	5.500 (.866)
Time of the last follow-up (months after HPP)	142.000 (.650)	6.000 (1.000)

Legend: HPP – health promotion program; * differences in HPP between the implementation within the regular school program and implementation by specially trained teachers; ** differences in HPP implementation between the 1st and 2nd educational cycles in primary school.

Cramer's V test and the Mann-Whitney U test did not prove statistically significant differences in most of the characteristics of the implemented school-based health promotion programs, according to the type of provider and the participants' grade at school (Table 4). However, one statistically significant relationship existed concerning the area of health. School-based programs dedicated to the promotion of mental health were statistically significantly more often implemented by a specially trained teacher than the physical health promotion programs (Cramer's V = .367, p = .025). Specially trained teachers delivered 71.4% of all mental health promotion programs, and only 28.6% were within the regular school curriculum. Moreover, 91.7% of all health promotion programs implemented by the regular school curriculum were oriented towards physical health content, such as obesity prevention, infection control, and cardiovascular disease prevention. It seems that health promotion programs in the first educational cycle are more likely to target other groups besides children, such as families, peers, teachers, and the community. Of all programs targeting multiple groups, 80% were implemented in the 1st educational cycle. However, most programs in all grades target children (86.5%). Therefore, Cramer's V did not show statistically significant differences in the target groups (p = .092).

Table 5: Differences in effectiveness of school-based health promotion programs according to provider

Effectiveness	**Total sample** (n=37)		**Changes in school curriculum** (n = 24)		**Specially trained teachers** (n = 13)		**Cramer's V (p)**
	n	**%**	**n**	**%**	**n**	**%**	
Reverse effect	1	2.7	0	0	1	7.7	.379 (.258)
No effect	8	21.6	4	16.6	4	30.7	
Partial/moderate effect	12	32.4	9	37.5	3	23.1	
Positive effect	13	35.2	10	41.7	3	23.1	
Strong positive effect	3	8.1	1	4.2	2	15.4	

Legend: SD – standard deviation; HPP – health promotion program; p – statistical significance.

As with previous findings, the effectiveness of school-based health promotion programs did not show any statistical significance according to the intervention provider (Table 5). More than three-quarters of the health promotion programs provided by school teachers within the regular curriculum achieved positive or moderate effects on children's health (79.2%). This figure was slightly smaller for programs provided by specially trained teachers (46.2%). However, health

promotion programs in school implemented by specially trained teachers showed a more comprehensive range of effects, from strong positive effect (2 studies) up to reverse effect (1 study). Moreover, Cramer's V (.274, p = .594) did not show any statistically significant differences in effectiveness according to school grade.

In taking a more in-depth look into the school-based health promotion programs that achieved no success or even reverse effects on children's health revealed exciting and unexpected findings, summarized in Table 6. Firstly, only one study among the analysed health promotion programs implemented on primary school children showed reverse effects on their health (Assaré et al., 2016). The rest of the eight analysed programs reported no effects after the cessation of the program. Secondly, all nine health promotion programs in Table 6 showed a similar assessment from the view of the intervention provider. Four of the programs (Chan et al., 2012; Rappaport et al., 2013; Thériault et al., 2014; Taylor et al., 2013) were provided within the regular school curriculum or in changes in school policy/regulations, and five of the programs were delivered by a specially trained teacher (Assaré et al., 2016; Challen et al., 2014; Kipping et al., 2014; Rousham et al., 2013; Tymms et al., 2016). According to their provider, these findings confirmed comparable effectiveness, as presented in Table 5.

Moreover, the school-based programs in Table 6 were engaged in various areas of health, e.g., cardiovascular disease prevention, promotion of healthy lifestyle and nutrition. The findings revealed an interesting fact: two of all three common infection control studies included in the review were placed in the group with no effects (Thériault et al., 2014) or reverse effects (Assaré et al., 2016).

Finally, some of the authors, for example Chan et al. (2012), tried to explain the low effectiveness of their intervention with methodological biases, such as nonrepresentative sample, short duration of the program or inadequately submitted experimental factor (e.g., small dose of dark chocolate). However, findings in Table 6 showed that school-based health promotion programs with no or reverse effects could be found within the duration of 18-hours (Challen et al., 2014) and up to five years (Assaré et al., 2016), within a small sample of 34 participants (Taylor et al., 2013) and up to programs with more than 8000 participants (Rappaport et al., 2013).

Table 6. School-based health promotion programs with reverse or no effect

Name of the HPP (author, year, country)	**Area of health**	**Methodology**	**Results – effectiveness**
SCORE-study (Assaré et al., 2016, Switzerland)	infection control	5-year CRT, 1-year follow-up (n = 75 schools)	the infection intensity among schistosomiasis mansoni-infected children was slightly higher in the 1-year follow-up compared to the baseline
UK Resilience Programme (Challen et al., 2014, United Kingdom)	mental health	18-hours QE, 1- and 2-year follow-ups (n = 2844 children)	no effects on signs of depression or anxiety
ChocHealth for Kids! (Chan et al., 2012, Australia)	blood pressure control	7-weeks RCT (n = 194 children)	similar systolic and diastolic blood pressure, anthropometry, and well-being on completion
AFLY5 - the Active for Life Year 5 (Kipping et al., 2014, United Kingdom)	healthy lifestyle	1-year CRT, concluding follow-up (n = 60 schools, 2221 children)	no significant effect on physical activity, sedentary behaviour, or vegetable and fruit intake
Nutrition education intervention (Rappaport et al., 2013, USA)	obesity	2-years CRT, 6- year follow-up (n = 10 schools, 8186 children)	no long-term effect on the incidence of remission of overweight/obesity with up to 2 years beyond the end of the intervention; obesity increased by 3%
Effects of iron supplements for schoolchildren in a remote area of north-west Pakistan (Rousham et al., 2013, Pakistan)	nutrition	12- and 24-weeks CS (n = 948 children)	no positive effect of iron supplements given 1 per week for 12 weeks or 2 per week for 24 weeks on the prevalence of anaemia in schoolchildren aged 5 to 17
Food Dudes programme (Taylor et al., 2013, United Kingdom)	nutrition	16-days QE, 3- and 6-month follow-ups (n = 8 schools, 34 children)	no positive effects on changing children's vegetable and/or fruit consumption
Health hygiene education program (Thériault et al., 2014 Peru)	infection control	4-months CS, 4-month follow up (n = 18 schools, 1088)	no significant difference between intervention and control groups in control of Soil-transmitted helminth (STH) infection
MOVE-project (Tymms et al., 2016, United Kingdom)	physical activity and well-being	6-weeks CRT, 6-month follow up (n = 75 schools, 1494 children)	no significant effects on physical activity and well-being of schoolchildren aged between 11 to 14

Legend: CRT – cluster-randomized trial; CS – controlled study; QE – quasi-experimental study.

3 Discussion

The systematic review showed that health promotion programs in primary schools are dominantly implemented through the regular school curriculum, without any additional costs or teacher training. Usually, the health-related programs are carried out for one school year with one or two follow-ups on after the intervention. The meta-analysis identified some crucial characteristics of school-based health promotion programs.

First, the health promotion programs in the systematic review mainly targeted dimensions of physical health, somewhat opposite to the suggestions that schoolchildren mostly report emotional or social problems and might benefit from interventions targeting these areas (DeSocio & Hootman, 2004; Sourander et al., 2008; Laaksonen et al., 2008). A similar comparison can be found in the systematic review and meta-analysis by Langford et al. (2015). They found a high prevalence of health promotion programs dealing with nutrition, physical activity, and healthy lifestyle and much fewer dealing with mental health issues.

Second, the findings revealed the significant fact that the structure of the health promotion programs does not differ according to grade level. However, there were slightly more target groups in health promotion programs implemented during the first three grades of primary schools. Li et al. (2013) showed that targeting more groups, such as children, their parents (home environment) and teachers (school environment) are effective combinations in addressing sleep behaviour and improving children's school performance.

Third, the successful school-based health promotion programs had an adequate duration and number of follow-ups. For example, the study by Assaré et al. (2016) implemented a follow-up after five years. The study findings showed an increased level of infection among children in the follow-up compared to the baseline level. The reverse effect of this program could be explained by the lack of interventional activities between its cessation and the follow-up. Much like in pedagogy, the repetition of health promotion is crucial for optimum outcomes in children's mental and physical health. It seems that analyses of follow-ups and their timing are strongly related to the effectiveness of health promotion programs, which should be investigated in future studies.

Fourth, positive effects on children's mental health and physical health were reported in interventions provided by teachers who were specially trained in pre-intervention (e.g., Bothe et al., 2014; Fairclough et al., 2013). This crucial finding should be considered in teacher education with an effort to increase their competences for promoting schoolchildren's healthy lifestyle and well-being. Our findings align with Kališnik (2003), who emphasized that care for health in the population should matter to social and humanities experts as well as to health professionals. Pedagogical theory and practice could significantly contribute to schools' high-quality health promotion programs and their positive effects on children's mental and physical health.

Finally, the study has many methodological strengths, such as the high quality of the studies under review, the age homogeneity of the studied group, and the inclusion of different countries and continents. However, the last is also related to the study limitation in that it reflects diverse social-cultural backgrounds, schools and healthcare systems. Future studies should extend their focus from the effectiveness of the programs to the teacher's opinions, perspectives and needs in providing health education and promotion in schools.

4 Conclusion

Primary school teachers have a significant role in promoting a healthy lifestyle and well-being among the children in their class. Our systematic review showed that mental health promotion is much less present in schools than programs focusing on healthy lifestyle, infection control, and cardiovascular disease prevention. Therefore, future teacher education should prioritize developing their competences in mental health promotion and the encouragement of a child's cognitive, emotional, and social development. These contents should have a visible place in the curriculum for teacher education.

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