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"Sky-High Motivation": Intradisciplinary Integrative- Courses for Excelling Teachers' Training

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Abstract: In many teacher education programs, curricula are comprised of fragmented courses within an academic discipline. This longitudinal study followed one cohort of teacher trainees in a fast-track B.Ed. program in Israel and explored an integrative approach to intradisciplinary courses. These courses were organized around significant themes and issues. A mixed-method methodology was implemented. The data included 81 teacher trainee responses, 16 mentor responses, and 11 college staff responses. Data were gathered during three years at four different time points: 1) online questionnaire for trainees and mentors (end of 1st and 3rd year); 2) trainee focus groups and steering group meetings (2nd year). Qualitative data underwent content analysis. Quantitative descriptive statistics were calculated to clarify the categories further. The findings showed that these courses contributed to developing new knowledge, empowerment, and exposure to constructivist teaching/learning processes. The conclusions underscore the potential of incorporating integrative intradisciplinary courses to advance teacher training programs.

Introduction

Curricula in many Israeli teacher education programs require teacher trainees to complete curriculum-based courses in specific subjects formatted as isolated one-semester units, especially within the Bachelor of Education (B.Ed.) programs. The B.Ed. is a four-year degree based on a curriculum consisting of educational knowledge (e.g., methods of instruction, foundations of education, educational psychology, philosophy and sociology, assessment, classroom management, special education, technology, evaluation, etc.), discipline knowledge (e.g., mathematics, literature, biology, etc.) and hands-on practical fieldwork. A significant disadvantage of these isolated one-semester units is the resulting fragmented view of knowledge (DeLuca et al., 2015). Teacher education programs based on such fragmented curricula are expected to provide independent areas of content-specific knowledge that will presumably be stored, processed, and integrated by the trainees (Hoban, 2004). Yet, when teacher trainees are exposed to multiple separate courses within the same discipline, they often express dissatisfaction, reporting substantial redundancies across their program and failing to recognize courses' relevance to their future teaching context (DeLuca et al., 2015).

A growing body of research has indicated that preservice teachers encounter difficulties in autonomously connecting discretely learned material and in applying their acquired knowledge appropriately in real-time classrooms, suggesting that theory should be taught in the context of practice, with particular emphasis on pedagogical content knowledge (DeLuca et al., 2015). This approach is being implemented regarding educational knowledge,

as many courses dealing with educational issues are unified via integrated courses (Darling-Hammond, 2006). Such opportunities to acquire pedagogical knowledge facilitate teacher trainees' engagement in cumulative learning, thereby portraying the interrelated nature of teaching (DeLuca et al., 2015). This curricular integration assists teacher trainees in identifying the links between educational ideas and processes. The current study explored the initial implementation of a connected, integrative intradisciplinary approach aimed at facilitating a more meaningful and unified construction of teachers' discipline knowledge (e.g., mathematics, literature, biology, etc.) and targeting high-achieving teacher trainees in a fast-track Israeli B.Ed. "excellence" program. The integration undertaken in the current study was unidisciplinary - the courses' contents were drawn from single disciplines (e.g., mathematics, English literature; see Table 1), integrating themes and contents from the disciplinary subject (Drake & Reid, 2020; Portaankorva-Koivisto & Havinga, 2019).

Fragmented vs. Connected Curricular Approaches

In the "fragmented" (or cellular) model for curriculum integration (Fogarty, 1991; Fogarty & Stoehr, 1995) that often continues to typify the separate course structure of discipline content in teacher education programs (Darling-Hammond, 2006), each element is taught in isolation without emphasizing different natural connections and without explicitly discussing wider, interrelated themes within each discipline, or with other disciplines. This model, although considered traditional and even outdated, still flourishes worldwide (Adolfsson, 2018).

In contrast to the fragmented model, the principle underlying the "connected" model of curriculum integration (Fogarty, 1991; Fogarty & Stoehr, 1995) is that learners of a specific discipline should be able to bring together its separate parts into a functioning, unified, and harmonious whole. When integrating the disciplines' contents, the various themes and concepts should be linked together cohesively, emphasizing the connections to enhance learning (Portaankorva-Koivisto & Havinga, 2019). Integrative curricula – courses organized around shared significant themes, problems, and issues rather than emphasizing subject-area boundaries are not new yet remain far less common than fragmented curricula in higher education settings (Darling-Hammond, 2006). In Israel, this approach is widespread when dealing with the education knowledge taught in the B.Ed. teacher training programs but is sporadic and often absent regarding discipline knowledge.

The Constructivist Context for Intradisciplinary Studies

The teaching process within the integrative intradisciplinary courses was expected to align with the constructivist approach, which attributes a central role to the teaching/learning process, as learners become active participants in constructing their own meaningful, unified body of knowledge (Kara, 2018). As opposed to instruction in which the instructor delivers a planned curriculum and makes the decisions about the content and sequence of learning (Vij, 2015), the constructivist instructor acts as a mentor or guide who stresses the importance of active, learner-centered processing and regulation of knowledge including problem-solving, collaboration, and inquiry (Basturk, 2016), often without a pre-planned lesson format. Although learning is structured around essential concepts in the preexisting formal curriculum, the constructivist instructor is expected to facilitate trainees' learning by flexibly and creatively offering diverse opportunities for self-determined learning and peer collaboration as stepping stones to learners' active acquisition of new knowledge and skills

(Vij, 2015). These principles were the guidelines for the mentors' instruction in the integrative intradisciplinary courses designed in the current study.

The Current Study Context

The current longitudinal study examined the initial implementation of integrative intradisciplinary courses for high-achieving teacher trainees in a B.Ed. program for Excellence in Teaching (named REGEV¹). The Israeli Ministry of Education established the REGEV special fast-track teacher training program to target exceptional college trainees who meet the program's stringent admission criteria (<http://cms.education.gov.il/EducationCMS/Units/Metzuyanut/Odot> [in Hebrew]). The program aims to develop an academically and personally top-notch educational cadre who will lead the country's educational system (Kimhi & Geronik, 2019). The national REGEV program trains excelling trainees at different teacher colleges nationwide. The current study was conducted at one such institution. The program at this institution was selected for investigation because its curriculum included components enabling the design of high-credit intradisciplinary units, allowing the excelling teacher trainees to complete their studies in the desired three years instead of the traditional 4-year B.Ed. When contemplating pedagogical options, the idea of creating rich, intensive, intradisciplinary courses taught following the constructivist approach seemed most logical.

The integrative intradisciplinary approach was applied to 30% of the REGEV Program's disciplinary courses at the investigated institution, which, as a pilot project, were only available to program participants. These courses spanned nine different disciplines (e.g., mathematics, English literature; see Table 1) in which the trainees were enrolled. All the courses were one semester long. Some were implemented during the first semester and some during the second, every year throughout the three-year program. Mentors, which were the course lecturers, were selected by the college rector, the various faculties' deans, and the disciplines' department heads. Recommended qualities for integrative intradisciplinary mentors included being flexible, creative, dedicated active lecturers who could lead a community of student learners. To enable close interaction between the mentor and the trainees, the courses were limited to small groups (up to 12 trainees per course). These courses were thus unique in educational approach, class size, high credit per course, and excellence of both trainees and mentors.

The integrative course design involved organizing the knowledge and skills within each discipline according to major themes. For example, the English literature course unified the study of literary pieces in prose and poetry around the concept of "the other" throughout a given century, as opposed to separate courses in poetry and prose in different eras. In special education, an example of a course's central theme was "complex disabilities," which examined comorbid disorders' academic, emotional, social, and cognitive perspectives as well as implications for education and rehabilitation, as opposed to separate courses for the various disabilities (autism, developmental disorders, and physical disabilities).

The remaining 70% of teacher trainees' disciplinary courses were taught using the traditional fragmented approach as carried out routinely in the college. Hence, trainees' and mentors' concurrent exposure to two curricular approaches – the novel integrative (connected) and the traditional isolated (fragmented) – provided an ideal context for participants' self-reported immediate comparisons, thereby eliciting reflection and evaluation

¹ REGEV is a Hebrew acronym for *Rosh Gadol Bahoraa* [Big Head for Teaching], referring to the Hebrew idiom of a "big-headed" person as a proactive person.

of the advantages and disadvantages of the unfamiliar disciplinary content delivery model. By applying a mixed method qualitative (content analysis) and quantitative (descriptive analysis) methodology, the present three-year-long study set out to examine assessments of these integrative intradisciplinary courses by the teacher trainees, the mentors who facilitated them, and college staff leadership during formal steering committee meetings, using two main questions:

1. What are the perceived advantages and disadvantages of learning and teaching in integrative intradisciplinary courses?
2. What factors can enhance the successful implementation of these courses during teachers' professional preparation?

Method

The current study was designed as a mixed methods study. The qualitative empirical aspects of the study are based on the interpretation of the participants' self-report (Roth et al., 2016). It was performed in a natural environment to follow, as precisely as possible, how the participants (teacher trainees, mentors, and college staff) perceived the specific situation in question (Denzin & Lincoln, 2000). Data were gathered from the field during three years at four different time points: (1) an online questionnaire for trainees and mentors (end of the first year of implementation); (2a) a trainee focus group and a steering group meeting at the end of the fall semester (second year of implementation); (2b) a trainee focus group and a steering group meeting at the end of the spring semester (second year of implementation); and (3) an online questionnaire for trainees and mentors (end of the third year of implementation). The quantitative aspects included descriptive statistics regarding the distribution of all participating teacher trainees, mentors, and staff members' responses by discipline and year of participation.

Participants

Table 1 presents the sources of the study participants' responses (trainees, mentors, and college staff) distributed by discipline and year. At the end of the first and third years of the study, the trainees and mentors answered an online open-ended post-course questionnaire. In the second year, the second-year trainees participated in two focus groups, and college staff participated in two steering committee meetings.

Teacher Trainee Responses (N = 81 responses, comprising 20 in the first year; 22 in the second; 39 in the third)

The teacher trainees (1 male, 19 females in the first year; 1 male, 21 female in the second; 4 males, 27 females in the third) were enrolled in B.Ed. studies via the REGEV Program at a teachers' college in central Israel. Trainees' ages ranged from 20 to 29 years, typifying Israeli students who generally begin undergraduate studies after mandatory military or national service. The trainees were trained to be teachers in various sectors such as preschool, elementary, high school, and special education. Elementary and high school training included at least one discipline.

In the first implementation year, 22 first-year trainees were enrolled in the semester-long integrative intradisciplinary courses, which were mandatory for them and optional for second and third-year trainees. In the second year, the courses were compulsory for first- and

second-year trainees and optional for third-year trainees. A total of 45 trainees were enrolled in such courses in the second program year, but only the 22 second-year trainees were invited to participate in the focus groups that took place twice during that year, at the end of the fall and the spring semester. The integrative intradisciplinary courses were mandatory for all program trainees in the third implementation year.

Mentor Responses (N = 16, comprising 5 in the first year; 2 in the second; 9 in the third)

The 16 responses came from 14 mentors. Two mentors, one from the first year and one from the second and third years, also participated in the staff meetings. Of the 14 mentors (9 female, 5 male), most ($n = 12$) held a Ph.D. in the discipline they taught in the integrative course, and the other two were considered experts in their field. Most ($n = 10$) were on a tenure track, and the others ($n = 4$) were promising newly recruited staff members.

College Staff Steering Committee (N = 11)

The college's president, rector, three faculty deans, the student dean, and the head of the program (author of this paper) ($n = 7$) were the constant members of the college staff steering committee (6 female, 1 male). Most ($n = 5$) were professors, one held a Ph.D. (head of the program), and one had an M.Ed. (student dean). Two educational staff members participated in the meetings, and two mentors were explicitly invited to talk about their experiences as mentors of the courses that took place in the first and second years. All held Ph.D.'s.

	Discipline	Trainee Responses								Mentor Responses								Staff Responses	
		1 st year ^a		2 nd year ^b		3 rd year ^a		Total		1 st year ^a		2 nd year ^c		3 rd year ^a		Total		2 nd year ^c	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1	Mathematics	9	45.0	10	45.5	16	41.0	35	43.2	1	20.0	1	50.0	1	11	3	18.8		
2	Special education	2	10.0	3	13.6	7	17.9	12	14.8	1	20.0	—	—	2	22	3	18.8		
3	Hebrew linguistics	—	—	—	—	2	5.1	2	2.5	—	—	—	—	1	11	1	6.3		
4	English literature	2	10.0	2	9.1	2	5.1	6	7.4	1	20.0	1	50.0	—	—	2	12.5		
5	Biology	2	10.0	2	9.1	2	5.1	6	7.4	—	—	—	—	1	11	1	6.3		
6	Music	—	—	—	—	2	5.1	2	2.5	—	—	—	—	2	22	2	12.5		
7	Early childhood education	3	15.0	3	13.6	2	5.1	8	9.9	1	20.0	—	—	1	11	2	12.5		
8	Literature	2	10.0	2	9.1	1	2.6	5	6.2	1	20.0	—	—	1	11	2	12.5		
9	Philosophy	—	—	—	—	5	12.8	5	6.2	—	—	—	—	—	—	—	—		
Total responses received		20	100	22	100	39 ^d	100	81	100	5	100	2	100	9	100	16	100	11	100
Total participants and % responding		22 ^e	90.9	45	48.9	50	62.0	45	N/A	6	83.3	12	16.7	14	64.3	14	100	11	100
Total possible responses and % received		22	90.9	22	100	58	67.2	102	79.4	6	83.3	2	100	14	64.3	22	72.7	11	100

^a Online post-course questionnaire ^b Focus group ^c Staff meeting ^d From 31 respondents ^e 1st-year trainees. Other trainees from the 2nd and 3rd years participated in the courses but not in the study.

Table 1: Distribution of Participating Teacher Trainees, Mentors, and Staff Members Responses by Discipline and Year

Assessment Measures

Data were gathered at four different time points from three different sources – trainees, mentors, and college staff – via three different measures to ensure triangulation and reduce researcher-participant bias (Lub, 2015). An online open-ended post-course questionnaire was adapted for trainees and mentors, notes were taken from focus groups held with trainees, and notes were taken from staff steering committee meetings (see Table 1).

Online Questionnaire for Trainees and Mentors

Questionnaires are the most common self-report assessment measure. Their validity is influenced by the participant's ability to connect the questions to their own teaching/learning experiences and consciously analyze their experiences. Students in higher education are expected to possess such skills (Roth et al., 2016). The questionnaire was used in the first and third years of the study. The 3-item open-ended online questionnaire asked respondents to evaluate an integrative intradisciplinary course they had recently completed as either a trainee or a mentor. The first item related to emotional rapport with the course: "How do you feel when teaching in the integrative course" (for mentors); "How do you feel when learning in the integrative course" (for trainees). The second and third items were identical for the trainee and mentor versions of the questionnaire: "What are the advantages of the integrative courses?" and "What are the disadvantages of the integrative courses?" The last item was not mandatory and asked trainees/mentors to write recommendations for improving courses.

Trainees' Focus Groups

During the second year of implementation, trainees were invited to participate in two focus groups at the end of the fall and spring semesters. The purpose of the focus groups was to examine the pros and cons of the courses as perceived by the trainees who had already participated in those courses during the first and second years. Focus groups inquired about improving the courses, using semi-structured questions based on the data and knowledge accumulated during the first year. All the trainees who participated in the first-year online questionnaire participated in the focus group, offering depth to the data and presenting a perspective from what they thought at the beginning relative to what they felt in the second year. A third-year trainee (who was not part of the study and was an excellent trainee and role model for other trainees) conducted the focus group meetings. The program's secretary transcribed the notes.

Steering Group Meetings

These meetings aimed to discuss the REGEV program in general and the gains, difficulties, and implementation of the integrative intradisciplinary courses during the second year. The meetings occurred twice during the second implementation year, once at the end of the fall semester and once at the end of the spring semester. Notes were taken and transcribed by the program's secretary.

Procedure

Ethical approval for the project was obtained in line with the researcher's institutional requirements (see Ethics section below). At the end of the first and third academic years, online questionnaires were sent to all teacher trainees and all mentors who had participated in the intradisciplinary integrative courses that year after trainees had received their course grades. Respondents were assured that completing the questionnaire was voluntary and anonymous and that data would be used only for learning and research purposes. The two focus groups and two college staff steering group meetings were held during the second year after the program head informed all participants that the courses were being reviewed to learn about their benefits and challenges.

Ethics

Ethical approval for the project was obtained from the institution's Ethics Committee. Two major ethical issues arose. The first was related to the teacher trainees' identity since they were still trainees at the colleges when the study was conducted. The second was related to the researcher's position since the researcher was also the program head. To prevent feelings of pressure and ensure anonymity, all the respondents (trainees and mentors) were assured that completing the questionnaire was voluntary and anonymous. The focus groups were conducted by a third-year trainee (who was not part of the study but was admired by the other trainees), thus enabling trainees to speak freely. The program's secretary transcribed the focus group notes, withholding all participating trainees' names.

Data Analysis

Qualitative data from the online questionnaire responses, focus group notes, and staff meeting notes underwent content analysis (Braun & Clarke, 2006) that was theory-driven, based on categories that arose from the data. In the primary analysis of the triangulated data sources, content analysis was performed by two raters, a qualified research assistant proficient in content analysis, and the head of the REGEV Program (the author). Each rater independently read through the entire data set and identified categories and sub-categories according to the various issues that emerged from the participants' written answers and the groups'/meetings' notes. They then discussed the categories' fit to the data and resolved all disagreements. The constant comparison process enabled them to identify emerging and unanticipated categories (Anderson, 2010). In a second analytic step, quantitative descriptive statistics (frequencies) were calculated to elucidate the categories further. Due to technical issues, the data from the steering committee were not included in the descriptive statistics of the implemented pedagogies (figure 2).

Results

The content analysis yielded five major categories representing the trainees', mentors', and staff members' perceptions of the integrative intradisciplinary courses. These categories are (a) development of new knowledge (participants' cognitive development as an outcome of the integrative course), (b) empowerment (participants' sense of individual growth), (c) mentor–trainee relationship (the relationship that developed between the participants), (d) effort and time (internal factors related to efforts and investment of time), and (e)

teaching/learning processes. Figure 1 shows the frequencies with which trainees and mentors mentioned each of the first four categories and sub-categories.

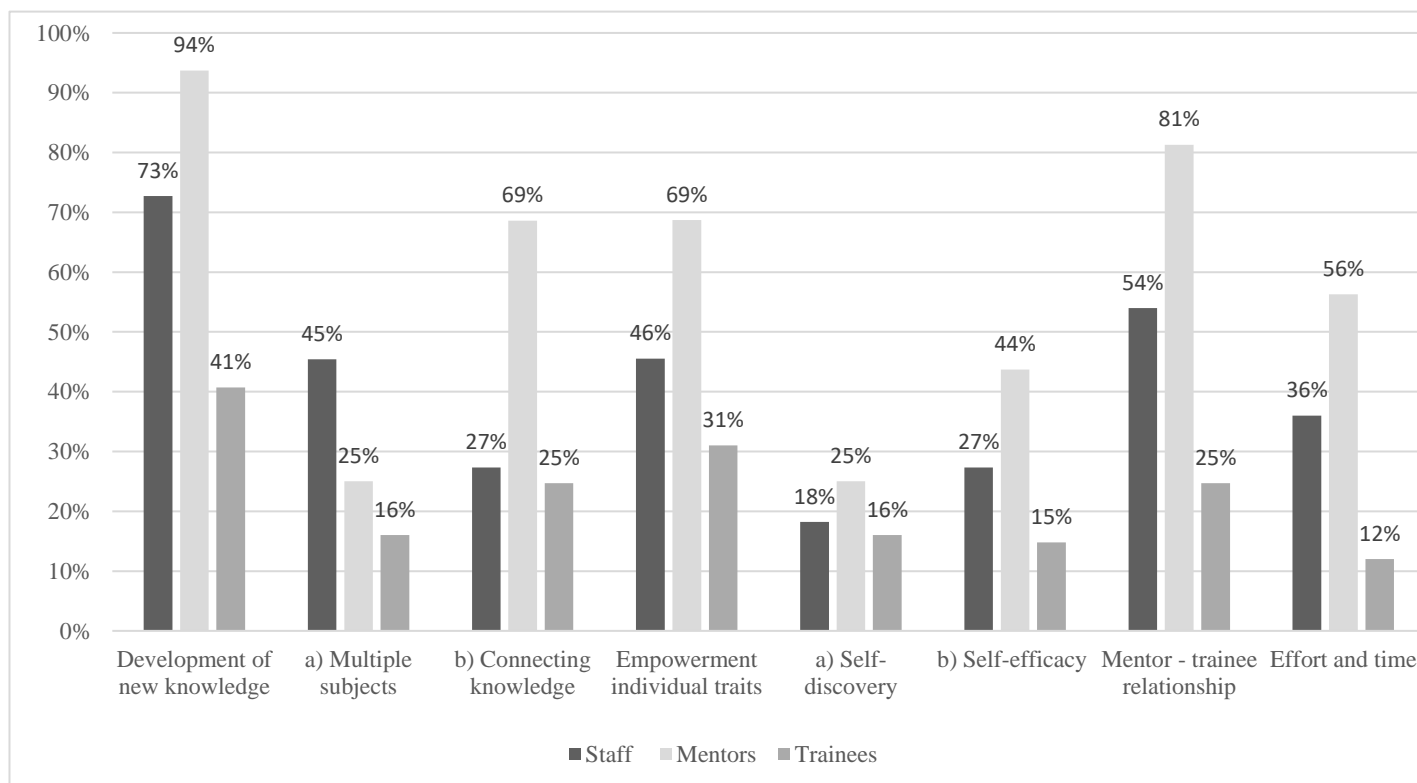


Figure 1: Percentages of Staff, Mentors, and Trainees Who Mentioned Each Category

Development of New Knowledge

This category relates to participants' cognitive development as an outcome of the integrative course. Two sub-categories comprised this category: multiple subjects within the same discipline and connecting existing and new knowledge.

Multiple Subjects (Intradisciplinary Knowledge)

This first sub-category is related to the advantages and disadvantages of the integrative intradisciplinary approach for knowledge acquisition of multiple subjects. On the one hand, the complexity afforded by these integrative courses permitted mentors to independently build extensive, inclusive, cross-subject courses in contrast to the narrower, fragmented courses they were accustomed to designing. Mentors underscored the positive impact of this integrative approach as enabling "constant shifting back and forth between the macro and micro level of the subject at hand, and not just teaching without relating to the wider context" (online, 1st year), thereby "orchestrating growing thematic knowledge" enabling trainees to "grasp the thematic connections in the subject" (online, 1st year). One of the trainees (online, 3rd year) described the intradisciplinary aspect as one of the most important and noteworthy advantages of the courses:

Each course is adapted to the trainee's needs, enriching and facilitating our learning experience. The course is connected to other subjects and themes that

we learn, and this doesn't happen in regular courses. The connection is made throughout the integrative course, by the mentor, and in our assignments.

Notwithstanding, the current findings indicated that, while teaching and learning in coherent, integrative courses, study participants had trouble shifting away from the fuller depth and detail of knowledge afforded by the standard fragmented courses. Some mentors and trainees expressed misgivings about conceding or "giving up" on some of the material covered in regular courses. As one trainee reported (first focus group, 2nd year): "Although the courses are fascinating, I kept on checking with my other classmates [who were not in the REGEV Program] and felt that I wasn't learning everything that they were learning, so I copied their notebooks just in case." This teacher trainee focused on the minute subject-matter details that she was "missing," without seeing the advantages of the more comprehensive integrative courses. Some mentors, especially in the first implementation year, brought up the same issues: "Although the course is different and creative, I can't teach them everything as I would in three or four different courses," and "I keep on checking if they are learning enough material, even though I know that the different pedagogies are also important." At the end of the second year, during the second steering committee staff meeting, one of the participants summarized:

The most significant shift could be seen in the integrative courses in mathematics. At the beginning of the process, they could not "give up" on any aspect of the regular courses' materials. Still, after two years, they built amazing intradisciplinary courses focused on mathematical thinking and learning processes and less on the subject matter.

Connecting Existing and New Knowledge

This second sub-category pertains to how the integrative courses relate to knowledge development. As one trainee explained (online, 1st year), the regular courses are often "sporadic and less coherent.... Moreover, connections between the subjects within the discipline are not obvious." Another trainee emphasized that although the learning is considered to be "more complex and intense" in the integrative courses, the connections made in these courses between existing knowledge and new knowledge facilitated the learning process, as the trainees managed to build a "new knowledge bank, which is easier to remember" (online, 3rd year). One staff member summarized that the integrative intradisciplinary courses should facilitate trainees' ability to make the connections between new and existing knowledge (second staff meeting, 2nd year): "Whereas the regular courses can often lead to confusion and lack of coherence, the integrative courses integrate wide areas of knowledge, thereby making the learning experience more relevant for the trainees."

Empowerment

This category describes the sense of individual growth that the trainees and mentors reported experiencing as an outcome of their participation in the integrative course. Two sub-categories comprised this category: self-discovery and self-efficacy.

Self-Discovery

Regarding this category of empowerment, the participants reported undergoing a process of self-discovery. Self-discovery was defined as a process facilitating the discovery of one's capacities and inclinations, including finding out about one's inner strengths or hidden abilities (Yair, 2008). Trainees described discovering their enhanced ability to learn and adapt to this course type. One trainee wrote online (1st year) about undergoing a process of self-discovery:

I was perplexed initially, but this learning experience taught me a lot. For the first time since I began my [college] studies, I was expected to cope by myself. The mentor assisted, but I had to look for materials and inquire myself. I learned how to learn. Furthermore, I found out that to inquire and explore independently is fascinating.

Mentors also described discovering their enhanced ability to plan and build this unique and innovative type of course. One mentor wrote enthusiastically in the 1st year online response: "For me, it was a whole new experience, in which, for the first time, I planned a creative course, considering the trainees' ideas. I was very flexible. Furthermore, we all succeeded!" Another mentor reported her sense of self-discovery as a learner-centered instructor (online, 3rd year): "Teaching these courses was a very satisfying challenge for me. Although I used previous knowledge, I learned new instructional methods, enabling much more self-inquiry and peer-based learning than I'd ever made possible." One mentor divulged an initial feeling of uncertainty before the course, followed by feelings of achievement and success upon its completion (online, 1st year): "Since it was the first time I ever taught such a course, I was very nervous and insecure, but these feelings passed, and I found that teaching in the course was very satisfying and interesting, as a lecturer."

Self-Efficacy

Regarding this second sub-category of empowerment, participants reported a sense of self-efficacy. Self-efficacy was defined as one's judgments of one's ability to participate in an activity successfully and the effect this perception has on one's future activities (Bandura, 1984). Mentors and trainees reported feeling in control of their teaching/learning situation and expressed the belief that they possessed the capabilities necessary to succeed. For example, one mentor relayed online (1st year): "The integrative courses gave the trainees a chance to be responsible for their learning in a wonderful way. I assisted them in learning how to learn, and they took responsibility and advanced the learning process in the course." According to one of the trainees (online, 1st year), learning in these courses developed her feelings of "independence, responsibility, and maturity."

Mentor–Trainee Relationship

The third category refers to the relationship that developed between the participants, which was pinpointed as an important advantage leading to positive outcomes. The small groups gave a feeling of "security and intimacy" (online, 3rd year). The small group size developed a unique mentor-trainee relationship. "We could investigate, ponder, and ask the mentor to expand on certain subjects and ideas. This special relationship with the mentor in the context of the integrative course facilitated significant learning, as opposed to the regular classes" (first focus group).

One mentor (online, 1st year) attested: "My accompaniment of the trainees enhanced my growth as a mentor and theirs as trainees." Furthermore, as one participant explained (second staff meeting, 2nd year), the instructor's shift in status from that of lecturer to that of mentor "...enables our [the trainee's and the mentor's] mutual development. I work together with them. The atmosphere is less formal and enhances our learning." The mentors often gave emotional support and helped the trainees deal with the intensity of the courses. The trainees found this less formal relationship to be an important, growth-promoting aspect of the integrative courses, as expressed by one trainee (online, 1st year):

The interpersonal relations with the mentor facilitated the learning process and gave us confidence and strategies to continue learning. We felt that the course was entirely adjusted to our needs and that our mentor was intent on leading us to success despite the difficulties.

Effort and Time

The fourth category refers to the internal factors related to efforts (Margalit, 2004), such as participants' readiness to invest effort in their courses and external technical issues related to trainees' long-term investment of time. On the one hand, trainees highlighted the benefit of these high credit integrative intradisciplinary courses as a "significant time saving" that enabled trainees to complete the program in three years rather than the four years typifying bachelor studies in Israel (online, 1st year). However, this characteristic of fast-track accreditation resulted in "very intense" courses (mentor, online, 3rd year), often attributed to their one-semester rather than yearlong duration. Consequently, both trainees (first focus group) and staff (second staff meeting) expressed feelings of frustration concerning time constraints (e.g., "more time was needed to complete the course") and difficulties in "dealing with the workload" and "learning all the material." Still, the expectation was that the trainees should be able to handle the workload "since they were from the high-quality REGEV program" (first staff meeting).

The trainees appeared to have internalized the integrative goals of these courses by recommending that the heavy workload could be eased somewhat if mentors tried to use alternative assessment methods among the course assignments, as described by the following trainee (online, 1st year): "Our discussions and developing thinking processes is what enriches these courses; therefore, the mentors should put less focus on assignments, and more on developing our academic process."

Learning/Teaching Processes

The final category focuses on the learning and teaching processes that emerged as significant to all parties involved. One of the mentors wrote (online, 1st year): "The various learning methods implemented in the courses enabled the use of a wide array of pedagogies." The trainees reported that their learning was "significant," engaging, "enriching," and "simply different and more constructive than the regular courses" (second focus group). Six pedagogical learning and teaching processes were explicitly stated as unique affordances of these courses: creativity and innovation, inquiry-based learning, peer learning, authentic individual learning, flexibility, and alternative assessment. Figure 2 presents the frequencies at which trainees and mentors mentioned these six pedagogies in their online questionnaires.

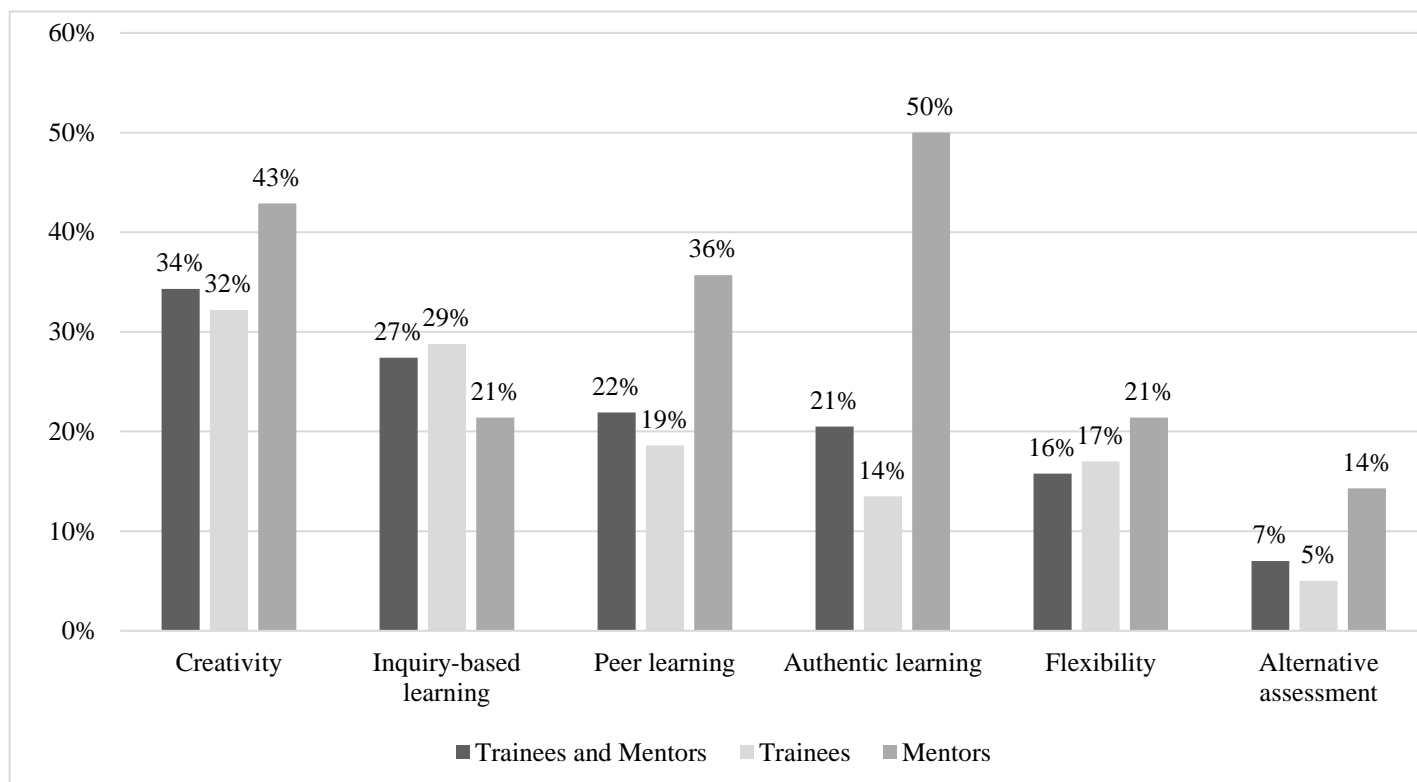


Figure 2 : Percentages of Trainees and Mentors Who Mentioned (Online) the Implemented Pedagogies in Their Integrative Intradisciplinary Courses

Creativity and Innovation

Learning via creativity is considered one of the primary benefits of this pedagogical aspect. As one trainee described: “[the courses] were exciting; the learning was different and made us think creatively, ‘outside the box’” (online, 3rd year). Another trainee expressed satisfaction regarding the creative aspects of the courses: “In one course [special education], we created a film about children with special needs. We interviewed teachers and parents. In another course [literature], we wrote articles about children’s books, and our articles were published online” (online, 3rd year). A mentor likewise talked about the importance of creativity: “The trainees had the freedom to choose, think, and be creative” (online, 3rd year). Not only did the trainees develop creativity in their learning, but the mentors themselves became more creative as they negotiated the unfamiliar leeway available to them while facilitating these integrative courses. During one of the observed staff meetings, one mentor clarified: “The courses gave us [mentors] the possibility to be creative and incorporate various techniques in our teaching, not just build a lecture and a slide presentation.”

Inquiry-Based Learning

Participants pinpointed this sub-category of active learning in the form of posing questions. As described by one of the trainees: “We were encouraged to ask questions, think by ourselves, and not wait for a prepared lecture” (online, 1st year). One mentor traced his role in promoting the development of trainees’ inquiry skills over time (second staff meeting):

At first, arriving at class without a prepared lecture was very difficult. I let the trainees pose questions, and according to the topics they brought up, I guided them to deeper and more meaningful learning. As the semester advanced, each trainee took more and more responsibility for their learning process.

Peer Learning

The following most frequent teaching/learning process was related to peer learning. When learning together, trainees build knowledge collaboratively instead of individually absorbing information prepared by their teachers. As reported by one trainee (online, 3rd year):

The main advantage of the course was the size of the group. We were a small group, and we learned together. For example, the mentor took us to a special needs kindergarten and sent us to interview teachers. We sat with the results and learned together. Each one [of the trainees] added her insight to the learning process. In a regular course, we scarcely leave the boundaries of the classroom unless it is a planned excursion.

As such, collaborative peer learning enabled connections between theoretical knowledge and the practical situations in which it is acquired and used.

Authentic Individual Learning

The participants mentioned how the courses encouraged and demanded a genuine, active, autonomous individual learning process. "I expected the trainees to bring their ideas into the meetings. They were expected to read about a subject and bring their questions and thoughts to the class. I based the lesson on their thoughts and questions" (mentor, 1st year). One trainee described the unique sensation of being actively responsible for one's learning process instead of merely being a passive recipient of information: "The feeling was great. I could develop my knowledge and felt I was advancing myself, not just writing down what the lecturer said" (online, 1st year).

Flexibility

Another means that enhanced the learning process was the mentors' flexibility. To adjust to teaching in the integrative courses, the mentors were expected to be flexible regarding the materials, assignments, relationships with trainees, and technical aspects such as attendance, number of meetings, etc. "The mentor adjusted the course contents to our inquiries" (trainee, 3rd year). As one mentor described (online, 1st year):

I tried to adapt to the challenge of adjusting my teaching plan to what was occurring during the course. Because the stated requirements were for me to adjust the course to the academic development of the trainees, I understood that I was expected to be flexible and accommodating throughout the semester.

Alternative Assessment

One of the intrinsic expectations when developing integrative intradisciplinary courses was to encourage alternative forms of assessment rather than standard exams and papers. One of the mentors assessed that the non-standard creative assignments during the course were a crucial motivating factor that promoted trainees' academic growth (online, 3rd year):

Together with the trainees, we decided that each trainee would plan and propose an initiative in any field relevant to the areas of the course. The initiatives fascinated them, and their motivation was sky-high. They initiated amazing ideas from scratch.

A trainee described his experience as "wonderful. We discussed alternative assessment, and then we decided to create short, Ted-like talks to summarize our projects. It was completely different, and we worked hard to succeed" (online, 3rd year).

Discussion

When planning the integrative intradisciplinary courses, creating rich, intensive, high-credit intradisciplinary courses seemed most practical and logical to design in a fast-track program. The intradisciplinary courses were designed to incorporate alternative teaching strategies, in line with the constructivist approach, thus addressing teacher education research that had identified many redundancies in the traditional, separate curriculum model (DeLuca et al., 2015). However, the course designers could foresee neither how these courses would manifest in real-time nor how they would be accepted by trainees and mentors alike since such courses had never before been implemented in the college's traditional faculties and departments housing the various disciplines. The current study aimed to examine the influence of the integrative curricula on the trainees' development and learning, the feasibility of these innovative courses, their advantages and disadvantages, and factors that could enhance their future implementation.

The Course Outcomes: Development of New Knowledge and Empowerment

The current findings clearly emphasized trainees' and mentors' positive outcomes from the integrative intradisciplinary courses, encompassing the development of new knowledge and skills alongside personal empowerment as the most salient categories. Each course was a coherent and unified unit where the mentors saw themselves as "orchestrators of growing thematic knowledge." Despite some challenges that arose along the way, the data clearly showed that these innovative, integrative courses successfully impart rich bodies of new cross-subject intradisciplinary knowledge to trainees. Similar to DeLuca et al.'s (2015) findings for an integrated curriculum approach targeting only elementary school preservice teachers, the REGEV Program's integrative course structure that targeted trainees of all school sector levels enabled the teacher trainees to develop a broader range of discipline-related knowledge, since the discussions regarding teaching and learning were more comprehensive than in the fragmented curriculum courses. Indeed, the trainees felt that this integrative intradisciplinary approach enabled them to formulate coherent connections regarding the subject matter that they could not achieve in separate, regular courses.

At the beginning of the process, many concerns were raised both by trainees and mentors about these innovative courses' exclusion of the explicit material that typifies separate curriculum courses and about missing out on what the traditional bachelor's degree trainees were learning. These fundamental concerns underscore the difference between the two approaches. In the conventional approach, the details of the various subjects are well-covered, but intradisciplinary links are weak, whereas the integrative approach furnishes coherent, well-developed links but risks losing out on some of the subject knowledge. This teaching/learning approach coincides with 21st-century globalization processes (which are

becoming less fragmented and more integrated) and the need for technological literacy. In other words, today's trainees need to be able to focus on understanding the bigger picture of the world and how everything links together. This will enable them to adapt more quickly to the rapidly changing environment in which they will find themselves, as well as to help reform the educational system to the changing needs of society.

The mentors – who had been hand-picked for this unique implementation process due to their well-acknowledged dedication, research orientation, openness to innovation, and expertise in collaborative learning strategies – described the empowering process of self-discovery that they underwent as they adjusted themselves to the challenges of building these complex new intradisciplinary courses. The courses' development, which took place under conditions of possible failure and uncertainty, was met with clear feelings of accomplishment. Yair (2008) showed how rigorous academic standards and challenging tasks led to meaningful self-discovery in numerous bachelor students in three higher education institutions in Israel. Similarly, the current trainees underwent a challenging learning process that led them to positive experiences of academic self-discovery and a feeling of self-efficacy. Similar findings, albeit for high school students, were found in a study that examined the impact of a discipline-based integrative project on teaching mathematics and arts (Portaankorva-Koivisto & Havinga, 2019). They found that the implemented collaborative learning united the pupils and the teachers, motivating them in the teaching/learning process.

The Processes and Conditions Leading to the Outcomes: Mentor–Trainee Relationship, Effort and Time, and Teaching/Learning Processes

The unique relationship between the mentors and trainees in the courses provided a space for mutual development. Trust and respect, as reported by trainees and mentors alike, appeared to permit a safe and supportive learning environment. There was a sense that mentors and trainees seemed to feed off one another's escalating enthusiasm for the novelty of this educational experience, offering each other feedback and sharing a sense of partnership in their pioneering role as participants in the pilot years of this project. This resonates with the constructivist approach, in which the role of the teacher is delineated as that of a facilitator, and the learners, or in this case, the trainees, are explorers who strive to expand their knowledge (Kara, 2019).

Success in education usually requires effort (Non & Tempelaar, 2016), as established in the sub-category regarding time and effort. In the current study, the mentors reported that developing the unique courses took much time and effort. Similarly, the trainees stressed that although the high credit system of these courses was highly motivating, the courses were intense with many academic demands. Generally, students with higher abilities that learn in better classes are characterized, for the most part, by higher-quality instruction (Carbonaro, 2005) and broader curricular coverage (Brophy & Good, 1986), as can also be seen in the REGEV program's innovative, integrative courses. Since these aspects of learning opportunities are associated with students' learning, one expects students in higher-ability groups to show higher achievements in learning (Carbonaro, 2005). These expectations were often discussed in the program's steering committee.

One of the current study's important findings was the successful use of a "wide array of pedagogies" and teaching/learning processes implemented creatively and flexibly in the courses. This wide array echoes results found in a study that examined a competency-based teacher training program in Tanzania. They found that the tutors (mentors) shifted from the classical teaching model to one in which the tutors scaffold and facilitate an open learning

environment, supporting individual learning styles (Tarmo & Kimaro, 2021). In line with the adage "Practice what you preach," teacher educators who model constructivist, learner-centered strategies to preservice teachers may enhance these trainees' likelihood of replicating such strategies in real-time with their future students. The trainees became active participants, and in line with the study's expectations, they changed their roles from passive learners to active ones (Drake & Reid, 2020). Both the mentors and the trainees in this study expressed deep appreciation for the courses' opportunities to experiment with novel self-constructed learning methods, class and homework assignments, and assessments of knowledge acquisition, thereby temporarily suspending the standard, traditional use of teacher-centered pedagogies based on exams and prepared lectures displayed via standard presentation software. The mentors were encouraged to lead their teacher trainees toward a challenging curriculum that promotes content acquisition through various teaching/learning processes intended to develop their trainees' cognitive strategies for self-construction of knowledge (Winterbottom & Mazzocco, 2015).

As such, constructivist-based teaching/learning processes, central to learners' growth, flourished in the intradisciplinary courses. For example, creativity development was reported as the most prominent among the array of pedagogies implemented. Enhancing creativity is crucial for advancing best practices in teacher education (Kimhi & Geronik, 2019). It aligns with educational policies and discourses worldwide as an essential means for promoting the future teaching quality of preservice teachers in professional training programs (Vincent-Lancrin et al., 2019). Furthermore, when examining the various practices implemented in the intradisciplinary courses, the joint construction of these courses established the foundations for a community of learners (MacPhail et al., 2014) and practitioners, in which, on the one hand, mentors and trainees had the opportunity to engage in shared learning processes. On the other hand, teacher trainees had the chance to engage in a collective learning process. Trust and respect, as reported by trainees and mentors alike, are vital ingredients for an influential community of learners (Whitcomb et al., 2009). All in all, the focus on the centrality of the learners, alongside the use of active pedagogies, is in line with the advanced curriculum trends seen in current international educational policy (Adolfsson, 2018; Drake & Reid, 2020).

In sum, developing a wide array of teaching/learning practices is fundamental for improving teacher education programs. Much criticism of these programs, both on a national and international level, is related to the emphasis that is placed on the trainees' knowledge of the subject matter, which is detrimental to their pedagogical competence (Werler & Tahirsylaj, 2022) and ability to implement an array of pedagogies. The process that both the mentors and trainees underwent during the three years in which the integrative courses were developed, implemented, and studied, enhanced a unique partnership between the trainees and the educators. This partnership created an exceptional space that enabled a rare dialogue between trainees and educators and for a shared and mutual responsibility for the teaching/learning process. This type of partnership is crucial, especially within higher education (Sjolie, 2014). It allowed the mentors to move, albeit with some discomfort initially, from the role of content expert to that of a facilitator (Drake & Reid, 2020).

Study Limitations and Conclusions

Although the current study's findings are novel and underscore the importance of building an intradisciplinary curriculum at the very least, the current sample of excelling teacher trainees and meticulously selected mentors does not represent the general teacher trainee and teacher instructor populations (Anderson, 2010); therefore, the conclusions should

be viewed with caution. Inclusion of direct observations or other tools, including various quantitative measures, might help to account for possible bias in self-reporting (halo effect or idealization) – future researchers could observe pedagogies and trainee and mentor behaviors or could do much finer-grain analysis of the decisions that participants made about courses' contents, themes, teaching/learning methods – separating trainees from mentors and analyzing courses by discipline. However, the study design's strengths, such as the 3-year data collection and triangulation of qualitative data sources, extend the knowledge concerning the rich potential afforded by incorporating integrative intradisciplinary courses with a range of constructivist pedagogies and teaching/learning processes into preservice training programs. Importantly, given that the primary objective of teacher training is to produce good teachers, researchers would do well to follow the graduates of this experiment in their subsequent careers to see if those trained in this way teach any differently or feel any differently about teaching compared to those who underwent the traditional program.

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