Stichting NIOC en de NIOC kennisbank

Stichting NIOC (www.nioc.nl) stelt zich conform zijn statuten tot doel: het realiseren van congressen over informatica onderwijs en voorts al hetgeen met een en ander rechtstreeks of zijdelings verband houdt of daartoe bevorderlijk kan zijn, alles in de ruimste zin des woords.

De stichting NIOC neemt de archivering van de resultaten van de congressen voor zijn rekening. De website www.nioc.nl ontsluit onder "Eerdere congressen" de gearchiveerde websites van eerdere congressen. De vele afzonderlijke congresbijdragen zijn opgenomen in een kennisbank die via dezelfde website onder "NIOC kennisbank" ontsloten wordt.

Op dit moment bevat de NIOC kennisbank alle bijdragen, incl. die van het laatste congres (NIOC2025, gehouden op donderdag 27 maart 2025 jl. en georganiseerd door Hogeschool Windesheim). Bij elkaar zo'n 1500 bijdragen!

We roepen je op, na het lezen van het document dat door jou is gedownload, de auteur(s) feedback te geven. Dit kan door je te registreren als gebruiker van de NIOC kennisbank. Na registratie krijg je bericht hoe in te loggen op de NIOC kennisbank.

Het eerstvolgende NIOC vindt plaats in 2027 en wordt dan georganiseerd door HAN University of Applied Sciences. Zodra daarover meer informatie beschikbaar is, is deze hier te vinden.

Wil je op de hoogte blijven van de ontwikkeling rond Stichting NIOC en de NIOC kennisbank, schrijf je dan in op de nieuwsbrief via

www.nioc.nl/nioc-kennisbank/aanmelden nieuwsbrief

Reacties over de NIOC kennisbank en de inhoud daarvan kun je richten aan de beheerder:

R. Smedinga kennisbank@nioc.nl.

Vermeld bij reacties jouw naam en telefoonnummer voor nader contact.

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Designing a Blended Learning Environment for an Android App Development Course: Helping Students Flourish

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Outline

1) Insights

Marcellis, M., Frerejean, J., Bredeweg, B., Brand-Gruwel, S., & van Merrienboer, J. (2024). Motivating students in competency-based education programmes: Designing blended learning environments. Learning Environments Research. https://doi.org/10.1007/s10984-024-09500-5

2) Applying the insights

3) How can these insights help you?

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Blended Learning Environment

Offline delivery methods

Physical location

- Workplace group work
- Self-study textbook
- Classroom teacher assessment

Online delivery methods

Independent of physical location using computer networks

- Online teacher lecture
- Online peer assessment
- Online quiz

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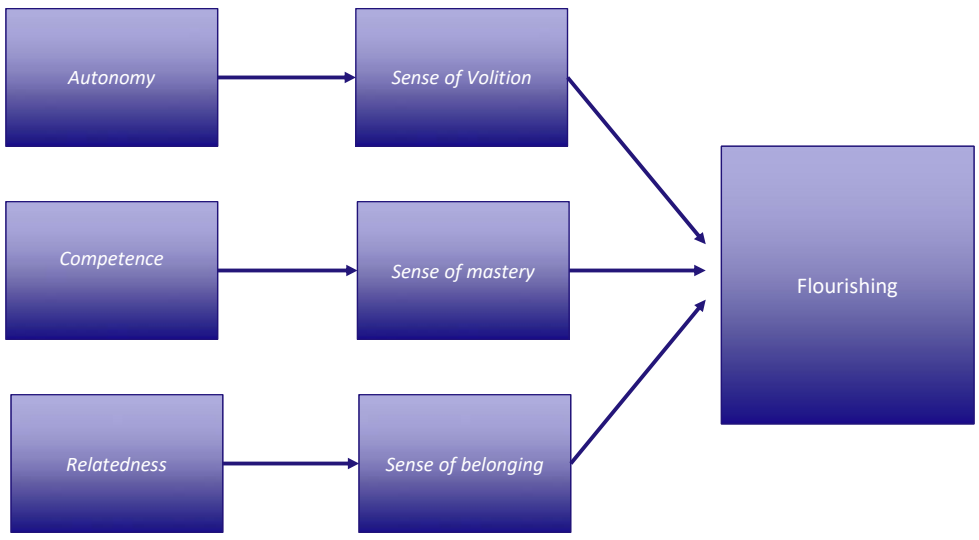
A Blended Learning Environment Can Support Students' Basic Psychological Needs



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Blended Learning Design Principles

A combination of delivery methods for **instruction** and **assessment** should:

(1) give students choices in time and place to support their need for autonomy,

(2) adapt to students' competency levels to support their need for competence

(3) stimulate students' relationship building with peers and teachers to support their need for relatedness.

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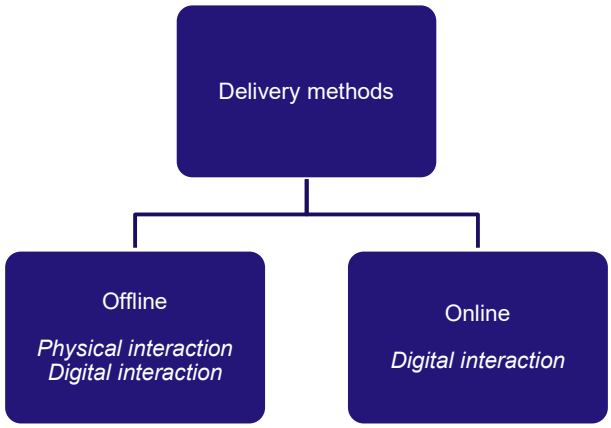
Delivery Methods have Interactions



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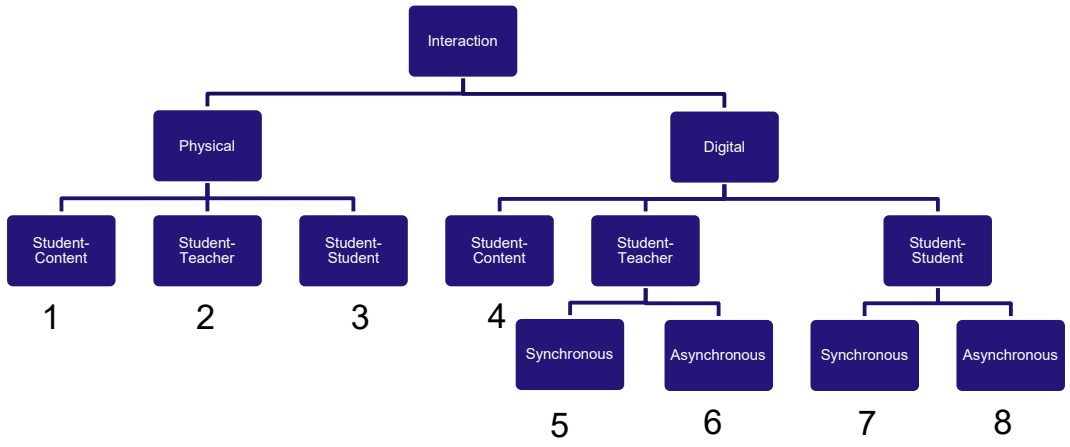
Eight *Student* Interaction Categories



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Example Delivery Methods

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Interaction category		Code	Delivery methods	
			Instruction	Assessment
1	Physical student-content	PHYSICAL-S-C	Self-study textbook	Take home paper-based test
2	Physical student-teacher	PHYSICAL-S-T	Classroom teacher lecture	On-site teacher oral exam
3	Physical student-student	PHYSICAL-S-S	Workplace group work	In-class peer feedback
4	Digital student-content	DIGITAL-S-C	Self-study recorded lecture	Online digital quiz
5	Digital student-teacher synchronous	DIGITAL-S-T-SYNC	Online teacher lecture	Online teacher assessment
6	Digital student-teacher asynchronous	DIGITAL-S-T-ASYNC	Online asynchronous teacher support	Online asynchronous teacher feedback
7	Digital student-student synchronous	DIGITAL-S-S-SYNC	Online peer discussion	Online peer assessment
8	Digital student-student asynchronous	DIGITAL-S-S-ASYNC	Online discussion board	Online asynchronous peer feedback

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Ranking in Giving Students Choices in Time and Place

Interaction category	Place-time characteristics		Ranking	Example delivery method
	Place Flexibility	Time flexibility		
Student-content (PHYSICAL-S-C, DIGITAL-S-C)	Yes	Yes	Very High	Knowledge Clip
Asynchronous (DIGITAL-S-T-ASYNC, DIGITAL-S-S-ASYNC)	Yes	A lot	High	Email
Synchronous (DIGITAL-S-T-SYNC, DIGITAL-S-S-SYNC)	Yes	Little	Moderate	Online lecture
Face-to-face (PHYSICAL-S-T, PHYSICAL-S-S)	Little	Little	Low	Classroom group work

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Ranking in Adapting to Students' Competency Levels

Interaction Category	Adaptability characteristics	Ranking	Example delivery method
Student-teacher (PHYSICAL-S-T, DIGITAL-S-T-SYNC, DIGITAL-S-T-ASYNC)	Teachers have "adaptive expertise"	Very High	Teacher feedback
Student-student (PHYSICAL-S-S, DIGITAL-S-S-SYNC, DIGITAL-S-S-ASYNC)	Students are less capable than teachers.	High	Peer feedback
Digital student-content (DIGITAL-S-C)	Humans can better respond to new situations	Moderate	Tutoring systems
Physical student-content (PHYSICAL-S-C)	Not really	Low	Textbook

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Ranking to Stimulate Students' Relationship Building

Interaction Category	Human connection	Ranking	Example delivery method
Face-to-face (PHYSICAL-S-T, PHYSICAL-S-S)	Directly and physical co-present	Very High	Classroom group work
Synchronous (DIGITAL-S-T-SYNC, DIGITAL-S-S-SYNC)	Directly	High	Online group work
Asynchronous (DIGITAL-S-T-ASYNC, DIGITAL-S-S-ASYNC)	Only indirectly	Moderate	Discussion forum
Student-content (PHYSICAL-S-C, DIGITAL-S-C)	No	Low	Knowledge clip

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Android App Development Course Design

Organizational

- 4C/ID model
  - Authentic tasks
  - Scaffolding

Delivery

- Blended Learning

Management

- Competency Based-Education
  - Students can work at their own pace
  - Formative assessments

Organizational: 4C/ID Model

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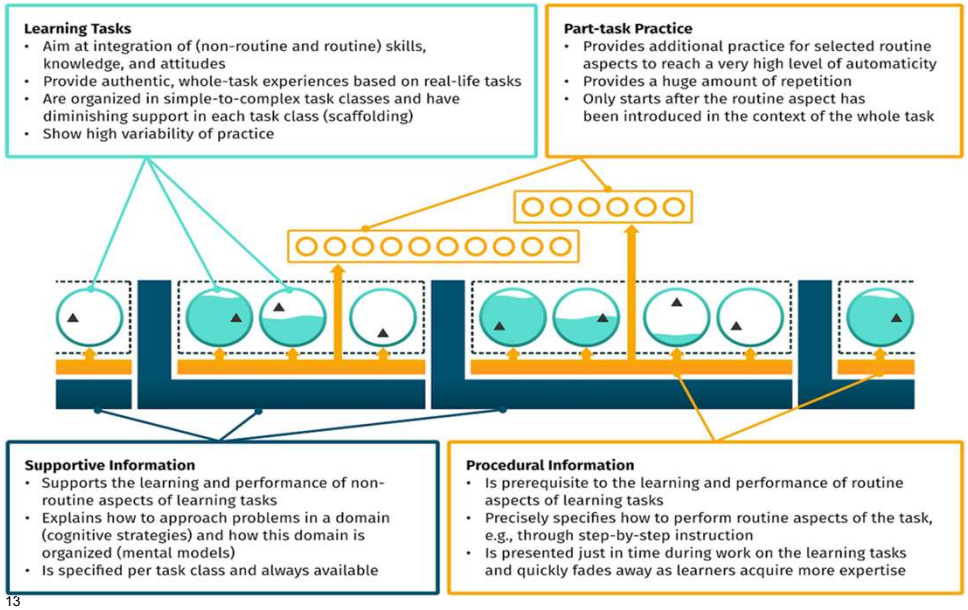

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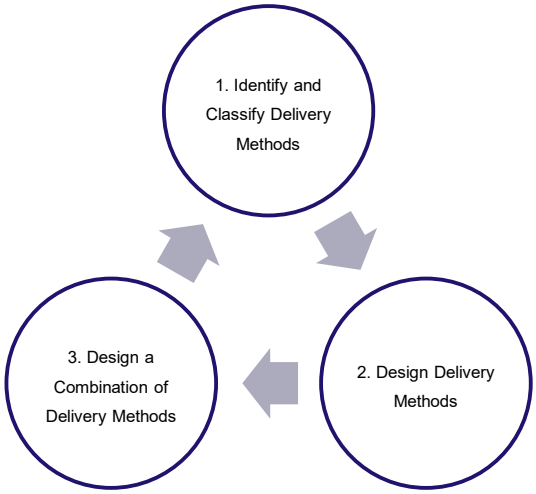
Delivery: Design Phases



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Delivery method	Interaction Category	Ranking	give students choices in time and place	Ranking	adapt to students' competency levels	Ranking	stimulate students' relationships building
Online self-study (learning tasks)	DIGITAL-S-C	Very high	Students who prefer to learn at their own time and place or are confined by time and place.	Moderate	They get feedback on their code from Android Studio.	Low	Not used.
Classroom self-study (learning tasks)	DIGITAL-S-C	Low	Students who want to learn at school.	Moderate	They get feedback on their code from Android Studio.	Low	Not used.
Classroom teacher assessment	PHYSICAL-S-T	Low	Not used.	Very high	Students receive feedback to help them to improve.	Very high	Ask about student progress.
Online teacher assessment	DIGITAL-S-T-SYNC	Moderate	Students can choose where to perform their assessment.	Very high	Students receive feedback to help them to improve.	High	Ask about student progress.

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Delivery method	Interaction Category	Ranking	give students choices in time and place	Ranking	adapt to students' competency levels	Ranking	stimulate students' relationships building
Classroom teacher demo	PHYSICAL-S-T	Low	Not used.	Very high	Adapt explanations of Android theory to students' competency level.	Very high	Teachers ask students questions and. promote discussions.
Classroom student code reviews	PHYSICAL-S-S	Low	Not used.	High	Students give feedback .	Very high	Peer ask questions
	PHYSICAL-S-T	Low	Not used.	Very high	Teachers give feedback.	Very high	Teachers ask questions.
Classroom peer assistance	PHYSICAL-S-S	Low	Not used.	High	Students give each other feedback.	Very high	Students help each other.

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The goal of a Blended Learning Environment

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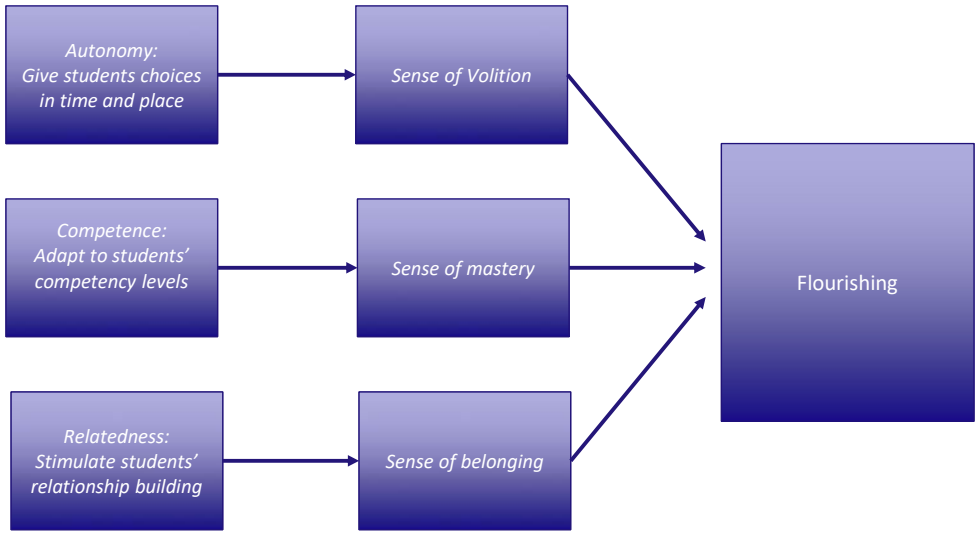

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Discussion

How can these insights help you design your blended learning environment?

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