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Evaluating Smart City Learning

New Learning Territories

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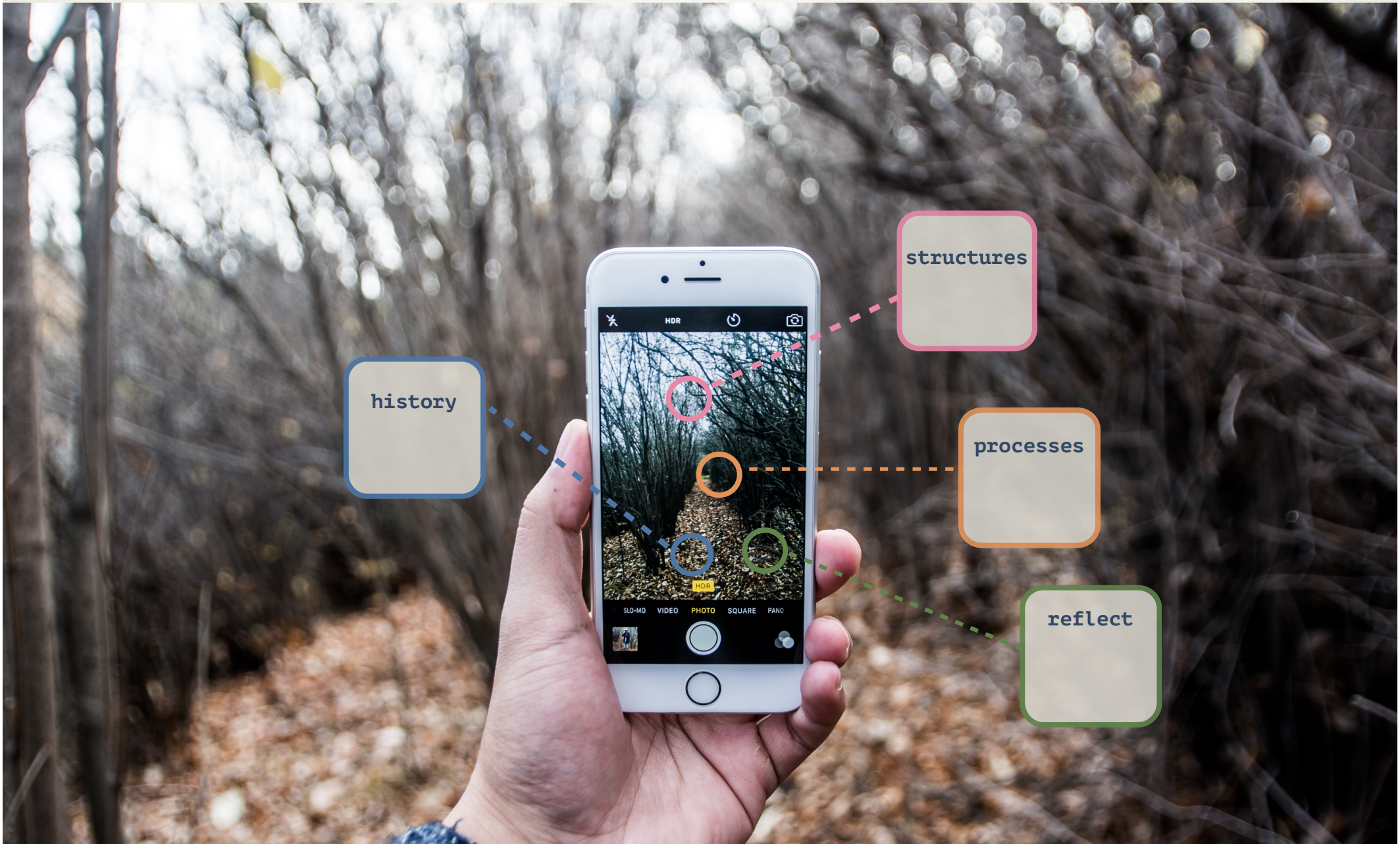
Smart City Learning

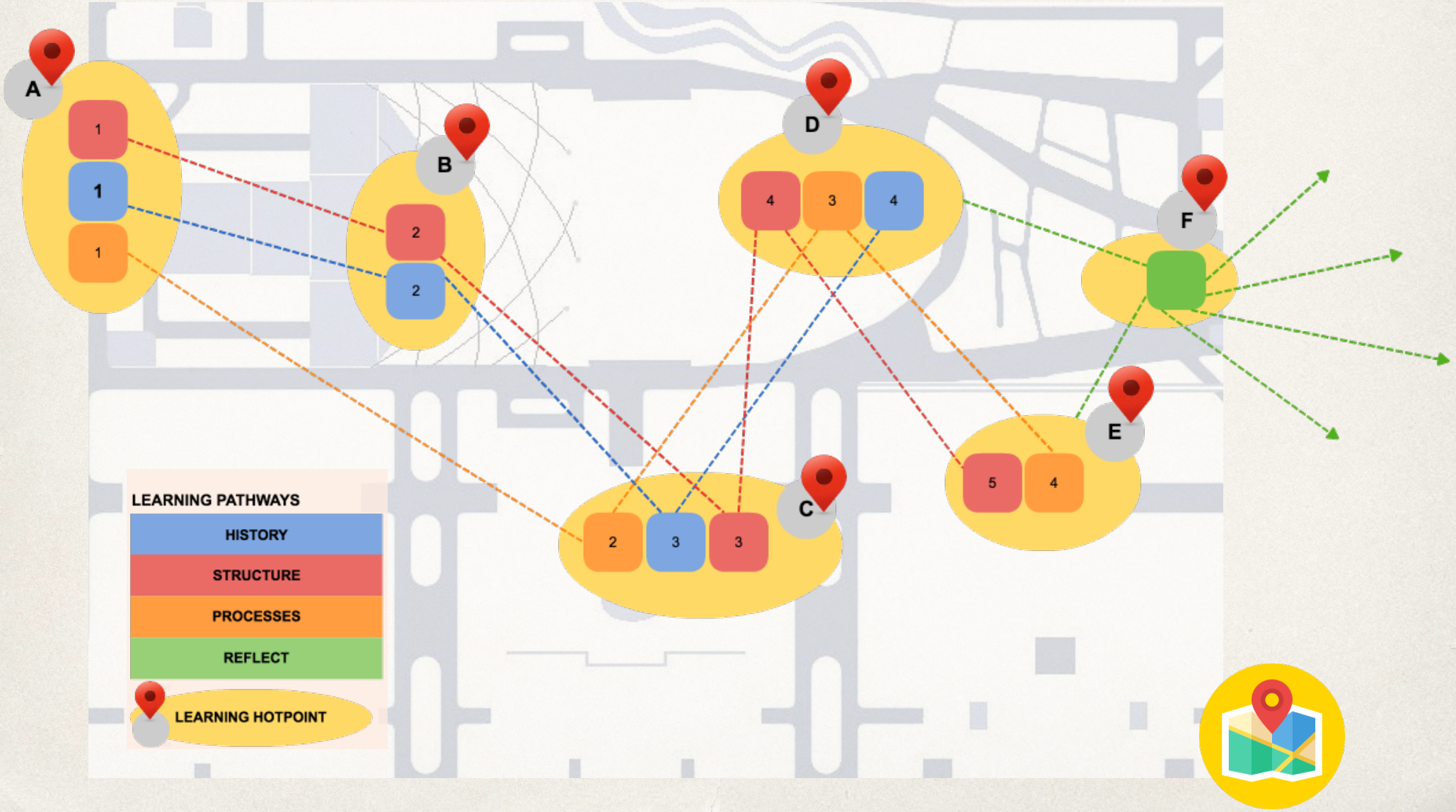
- What is **smart city learning**?
- How do we **design for effective learning** in smart city urban spaces?
- What is the nature of a **user-learner experience** in smart city learning?
- How do we **measure and evaluate** user-learner experiences in smart city learning?

Smart City Learning: *Argotti Gardens*



Smart City Learning: *Argotti Gardens*

Learning Pathways and Hotpoints



Smart City Learning: *Argotti Gardens*

Smart City Learning *Interactions*

What is the nature of a user learner experience?

- **Interaction variables**
  - *Digital tools*
  - *Content*
  - *Community*

Smart City Learning *Interactions*

Interaction Layers

Learner Group

Age
Gender
Learning Level (participating)
Educational Level
Technical Literacy
Nationality

Domain

History
Botany

Pathway

History
Structures
Processes
Reflect

Stage of Activity/Pathway

Stage 1
Stage 2
Stage 3
Stage 4

Learning Level

Basic Facts - Novice
Concepts - Novice
Problem Solving - Support
Problem Solving - Guidance
Metacognition - Contributory

Consume content

- attributeA(Learning Content)
- attributeB(User-Learner Con.)

- methodA (Read)
- methodB (Listen)
- methodC (Watch)

Create content

- attributeA (Int/App)
- attributeB (Ext/Social)

- methodA (Write)
- methodB (Record audio)
- methodC (Take photo)
- methodD (Record Video)

Share content

- attributeA (Int/App)
- attributeB (Ext/Social)
- attributeC (private/closed)
- atrributeD (public/open)

- methodA (Learning Content)
- methodB (User-Learn Con.)
- methodC (*Other* Content)

Read Comments

- attributeA (private/closed)
- attributeB (public/open)

Respond to Comment(s)

- attributeA (private/closed)
- attributeB (public/open)

Start New Comment Thread

- attributeA (private/closed)
- attributeB (public/open)

Share Comment (s)/thread

- attributeA (Int/App)
- attributeB (Ext/Social)
- attributeC (private/closed)
- atrributeD (public/open)

- methodA (Int/App > Learning Content)
- methodB (Int/App > User-Learner Content)
- methodC (Ext/Social > Learning Content)
- methodD (Ext/Social > User-Learner Content)

- contentTypeA (Text)
- contentTypeB (Image)
- contentTypeC (Audio)
- contentTypeD (Video)
- contentTypeE (Other)

Smart City *User*-Learner *experiences*

Methodology and areas of investigation

- **User-learner experiences in smart city learning have multi-layered interactions**
- How do we **measure and evaluate** these user-learner experiences?
  - **Phenomenography** - *when, where, what, why, who and how*
  - **Human Computer Interaction** - *usability*
  - **Analytics data** - *e.g. time on hotpoint, number of interactions, frequency of shares, amount of connections between learners*

Smart City *User*-Learner *factors of interest*

Factors determining learning

- Facts
- Concepts
- Problem solving
- Metacognition

Human Computer Interaction

- Interface design
- Perceived usefulness
- Perceived ease of use
- Frictionless

Social Interaction & Connections

- Identity
- Networks
- Sharing
- Community

Impact of the authentic space

- Seamless
- Immersive
- Glocality
- Crowd sourcing

Evaluating Smart City Learning

Phenomenography of interactions *measurement factors*

HCI Factors

- Perceived Ease of Use
- Perceived usefulness
- Usability

Technical Efficacy

- Surface
- Deep

Socialness

- Sharing of content
- Liking/Commenting on content
- Concept sharing in social channels
- Amount of likes and shares
- Sentiment of comments

Why, Who

- Affective - emotional reasoning
- Conative - actions resulting from cognitive and affective engagement

Identity & Role

- Receiver
- Supporting
- Guiding
- Leading

Authentic space engagement

- When and where
  - In stage of learning
  - Time - 'realtime' or afterwards?

What, Who

- What features in the content?
- Domain content - cognitive
- Affective content (friends, self)
- What is being talked about?
- Who is being talked to?

Evaluating Smart City Learning

Phenomenography of interactions *outcome space examples*

Outcome Spaces (predicted) **External Reflector**: Register on the WAY-Cyberparks application	
Variation Category 1: Negative Registration experiences	I hate doing this kind of thing It was too fussy I couldn't use Facebook I don't use social media anyway It didn't work I don't give my email to anyone *Other negatives*
Variation Category 2: Positive Registration experiences	It was ok I had no problem Mum said it was easy I think its fun I used a mad username I thought I might use it again so it was worth the hassle *Other positives*
Variation Category 3: Neutral Registration experiences	Not sure Don't know Didn't think about it *shrugs shoulders* Mum did it *Other neutrals*

Digital Tools

Outcome Spaces (predicted) **External Reflector:** Upload photograph to learning activity	
Variation Category 1: When it was taken	I took it before I started (the activity) I took it during the activity but before I finished I took it after I finished the whole thing I took it on task number or task name Time of day
Variation Category 2: Where it was taken	The location in general The location, at the learning 'stage' or activity area Somewhere else related Somewhere else not related
Variation Category 3: What is in image and relevance	Building, Tree, Flower, Art, Person, Statue, Animal *Type of shot:* Vista, Close up, detail On or off topic
Variation Category 4: Who is in the image	Friends Family Strangers Classmates Myself No one
Variation Category 5: Emotion of content	Violent Angry Peaceful Happy Beautiful
Variation Category 6: Why it was taken	I felt like it I wanted to show I was there My friend looked cool I was into it I wanted to remember My mum asked me to It looked really old It was pretty

Learner generated content

Outcome Spaces (predicted) **External Reflector**: Individual posts comment (e.g. about image)	
Variation Category 1: Who is being addressed (or referenced)	Named Individual Inferred individual The specific group on that thread A generality of assumption Summoning larger perspective
Variation Category 2: What (comment content)	Concrete concepts Questioned knowledge Trivia Opinions Shared facts
Variation Category 3: Active contributions or questions to discussion	What if we… What are you saying about … What makes you say that? If such and such was the case … In class we did … I remember another similar …
Variation Category 4: Tone/emotion positive or constructive	That's so true Hahahaha It's amazing Gorgeous/lovely idea/work/skill Imagine if …
Variation Category 5: Tone/emotion negative or destructive	That's rubbish I don't believe that You just made that up Negative memes
Variation Category 6: Tone/emotion neutral	I have no clue what you're talking about No idea Off topic

Community

Augmenting real spaces with learning

Human Computer Interaction

Interface design

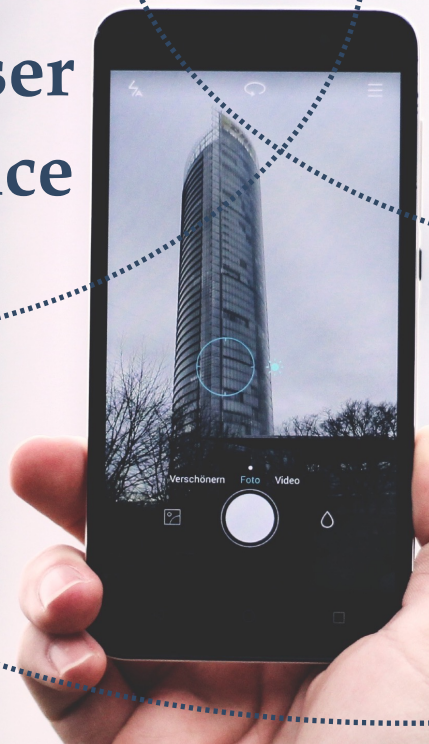
Application Development

Pedagogy & theory

Learning Design

User Experience

Learner Experience



Urban Planning

Architectural Design

Technical Infrastructure

Smart City Learning *Sources*

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