The Use of Learning Maps and Bayesian Network Analysis to Improve Education

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Professor of Educational Psychology
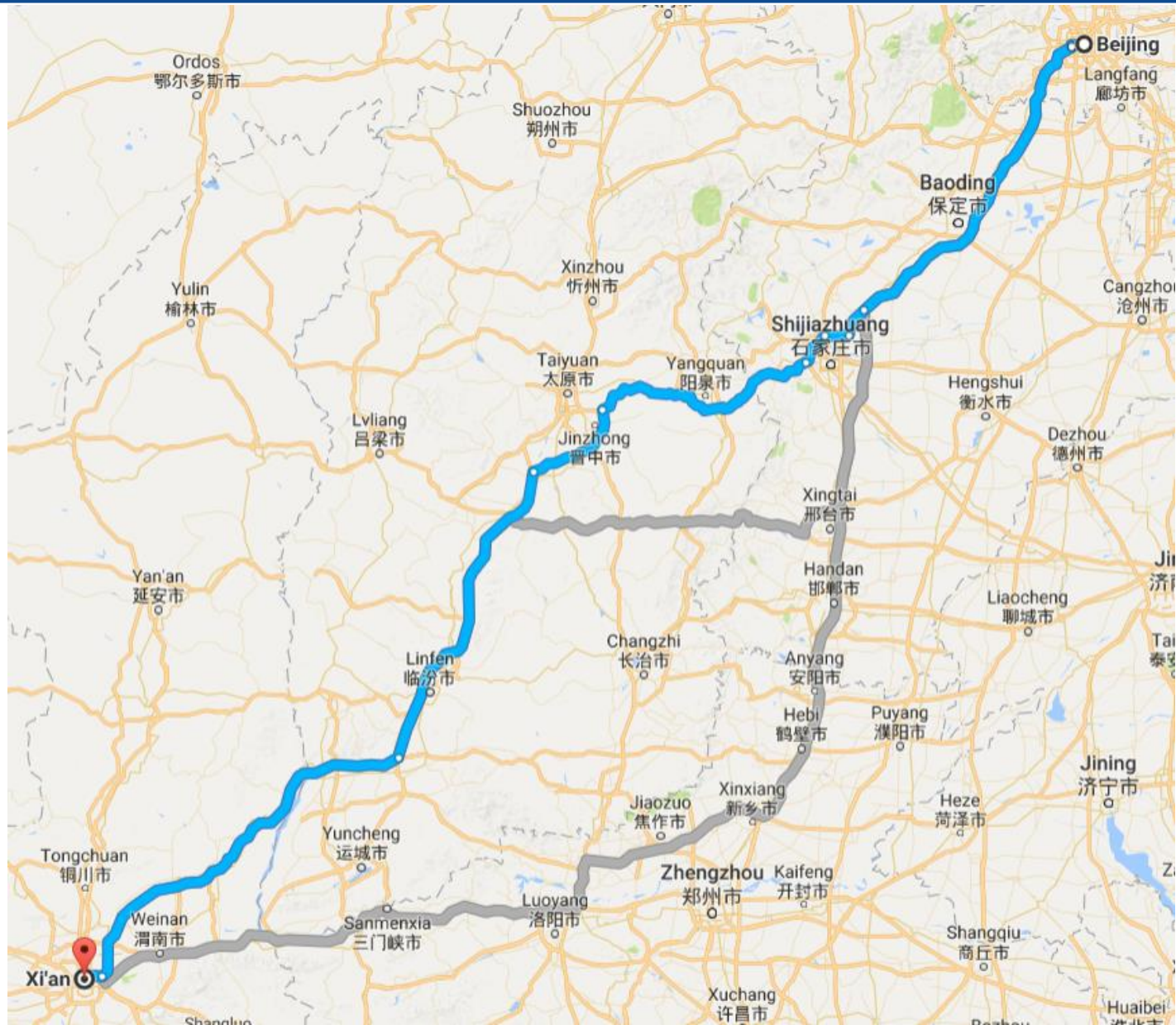**and Director of the Achievement and**
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KU THE UNIVERSITY OF **KANSAS**

Beijing

Shijiazhuang
Baoding
Linfen
Jinzhong
Yangquan

Xi'an

Beijing
Baoding
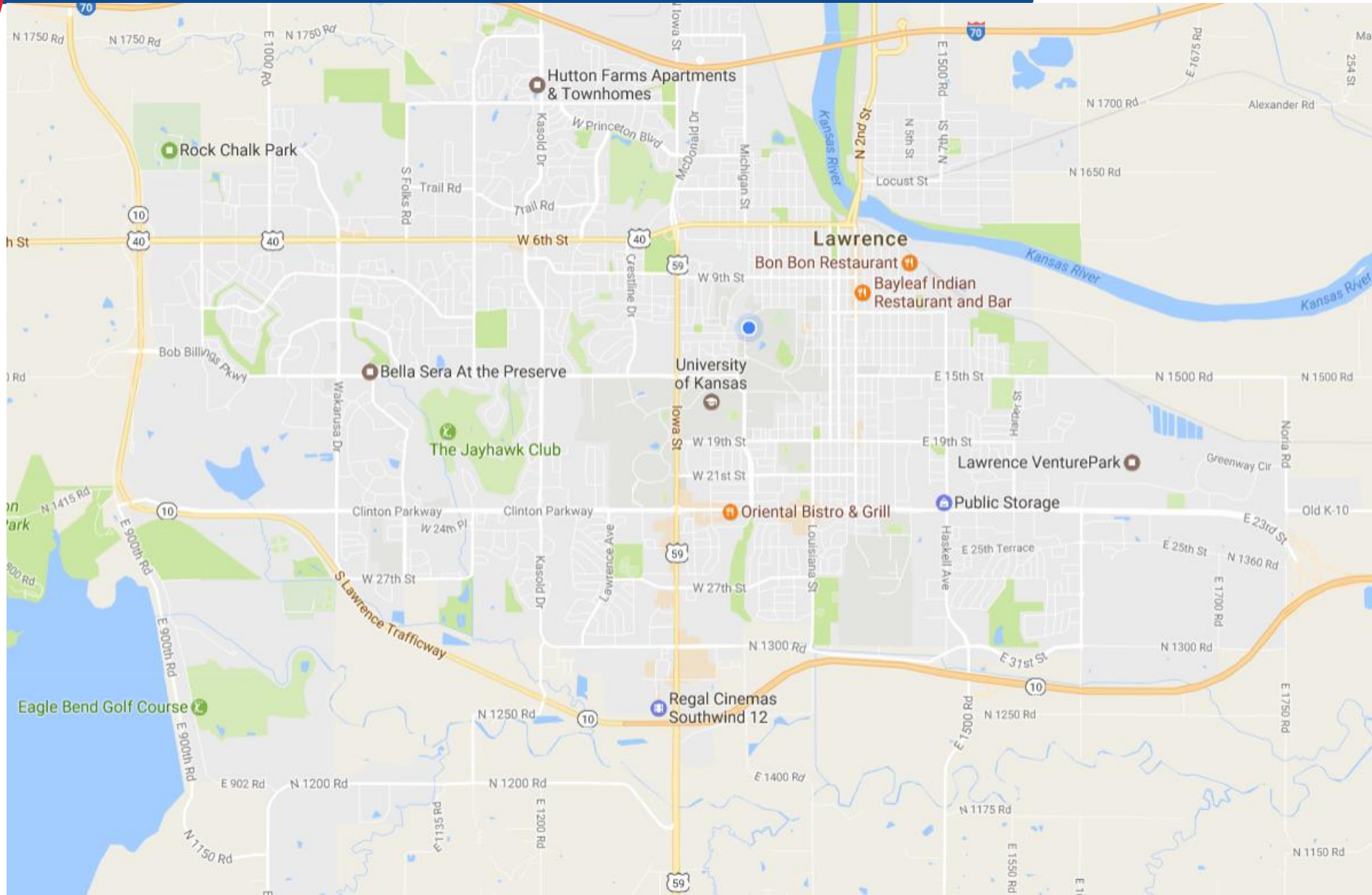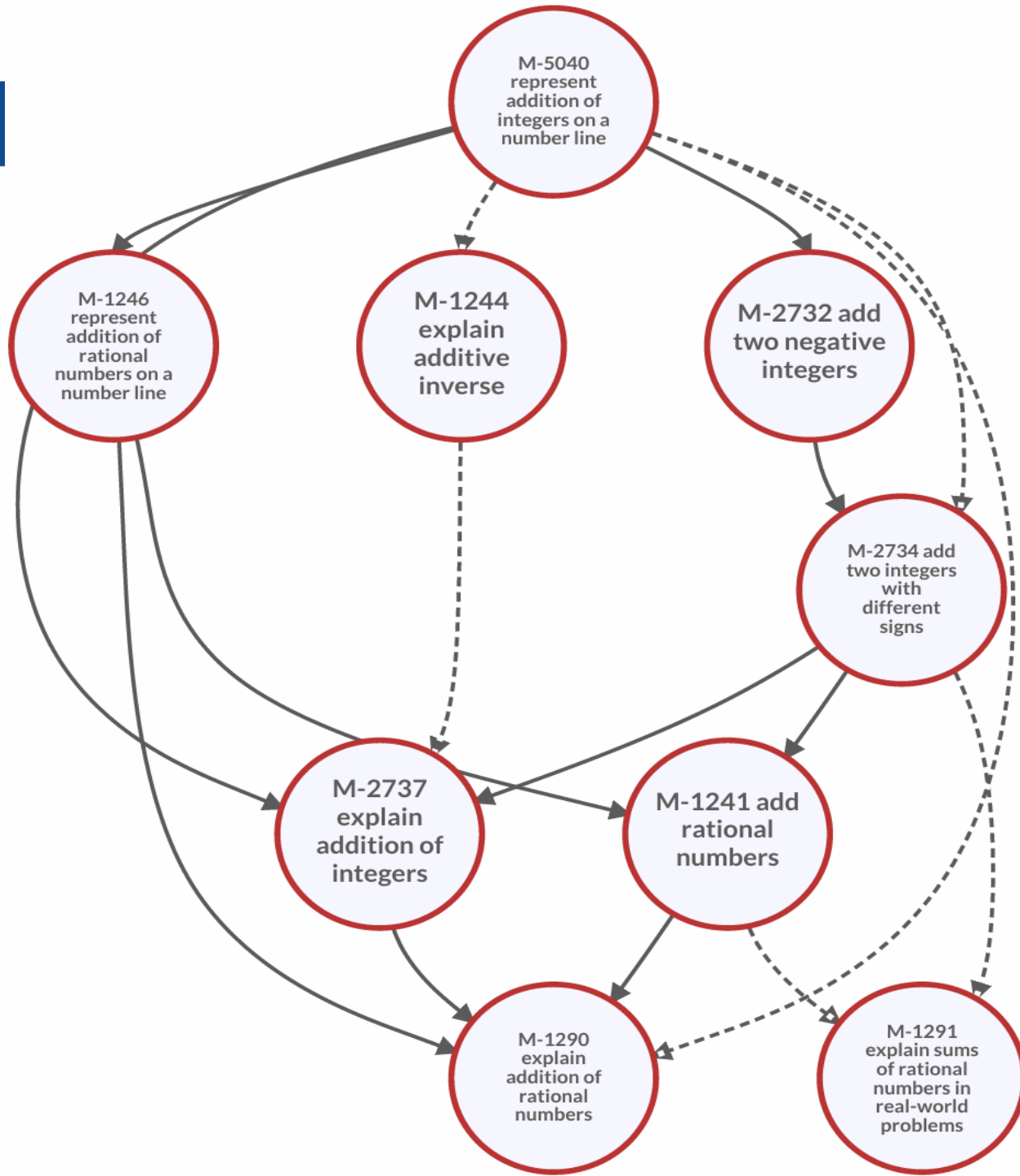Shijiazhuang
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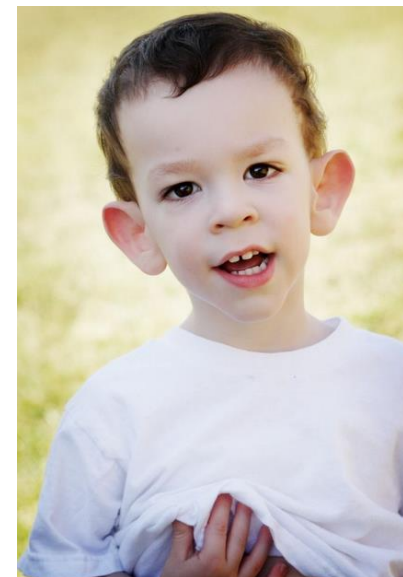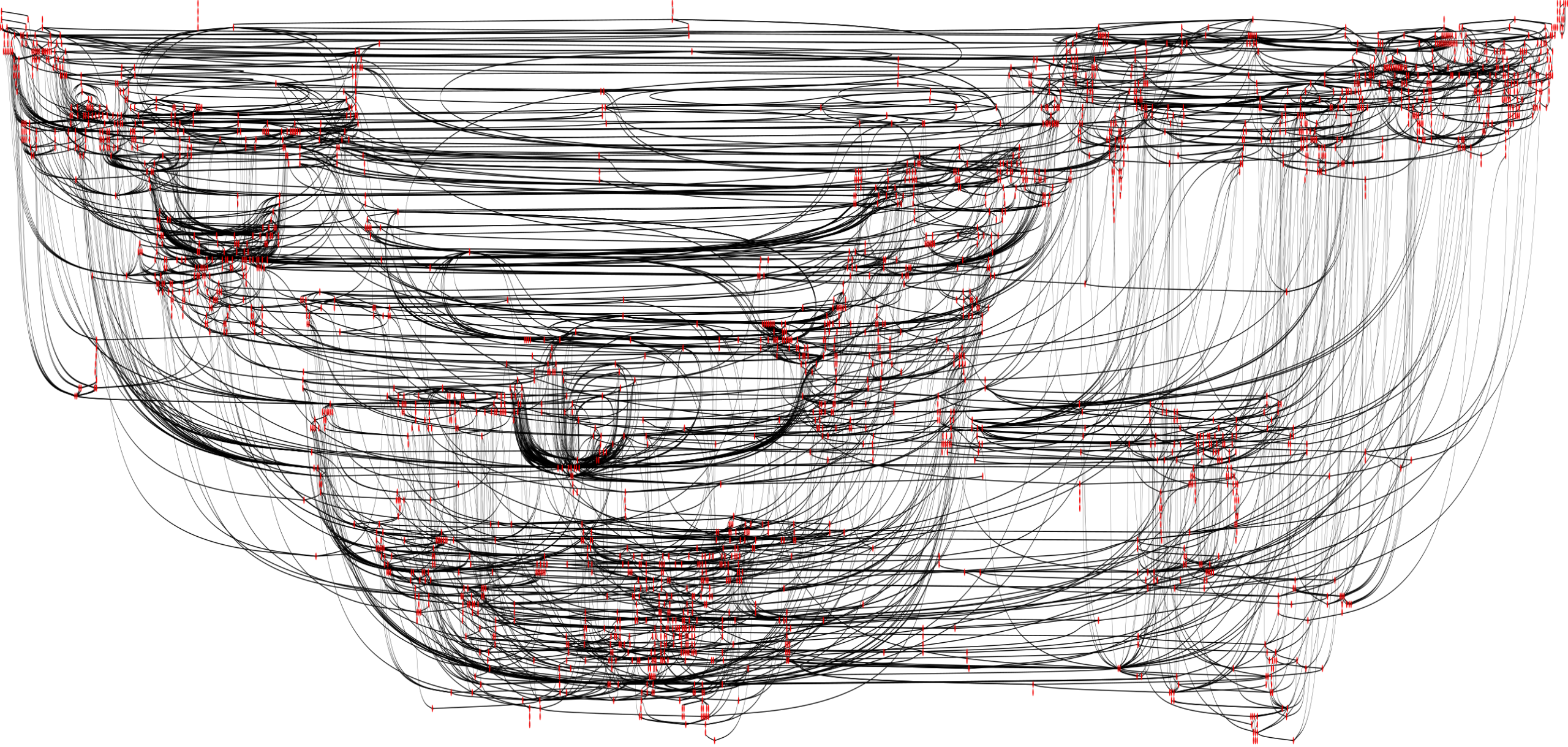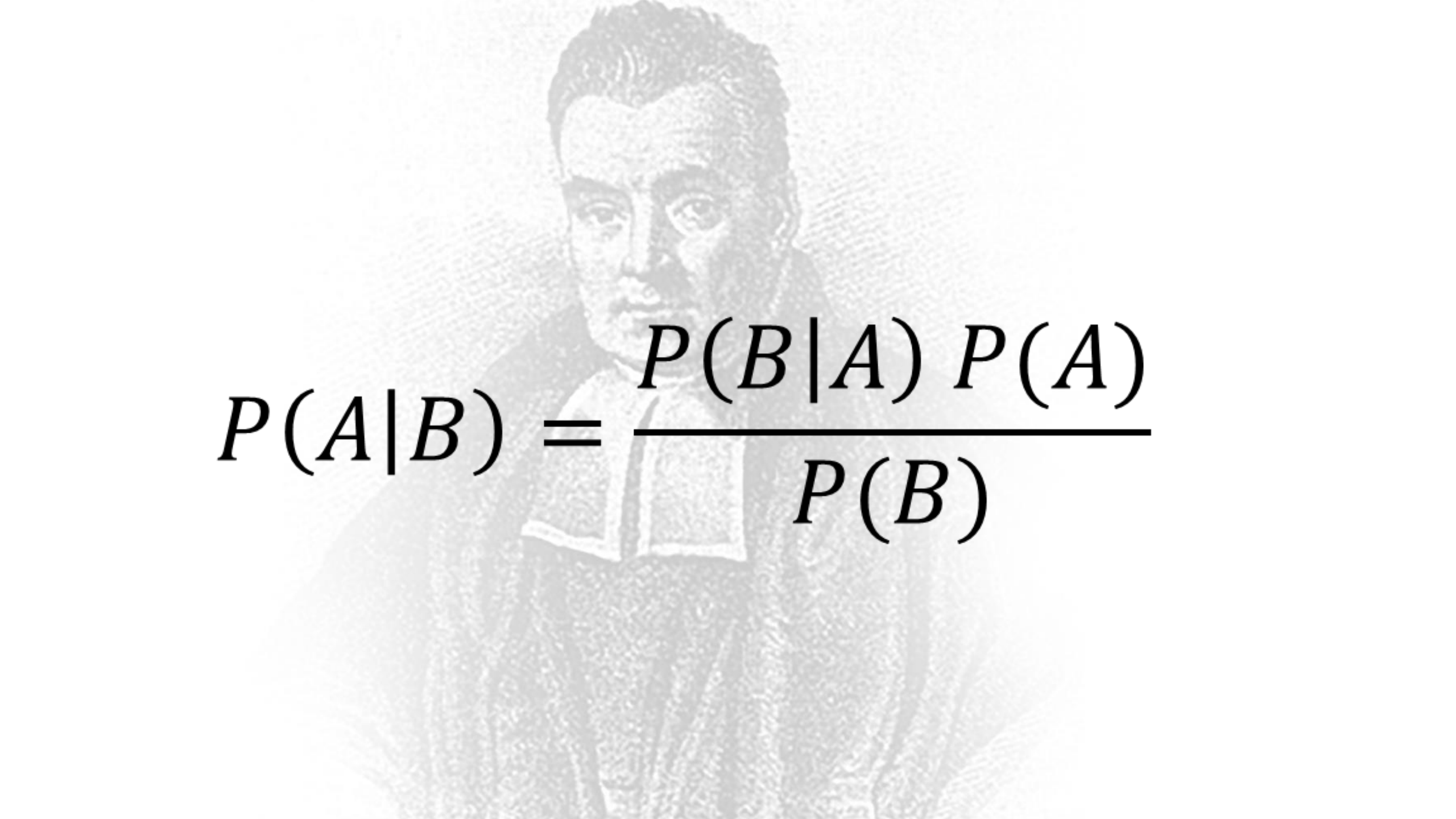
UNIVERSITY OF KANSAS MATHEMATICS LEARNING MAP

2554 NODES & 5605 CONNECTIONS

$$P(A|B) = \frac{P(B|A)\,P(A)}{P(B)}$$

Node: M-2568

Node M-2567	Non-Master	Master
Non-Master	.75	.25
Master	.40	.60

Node: M-2567

Non-Master	Master
.40	.60

Item: 17384

Node M-2567	Correct	Incorrect
Non-Master	.30	.70
Master	.90	.10

Item: 17379

Node M-2567	Correct	Incorrect
Non-Master	.40	.60
Master	.80	.20

Node M-2567	Correct	Incorrect
Non-Master	.10	.90
Master	.75	.25

Item: 17390

Area	Essential Element	Grade Level Expectation	LEVEL MASTERY				
			1	2	3	4 (Target)	5
DETERMINING CRITICAL ELEMENTS OF TEXT	RL.3.1	Answer who and what questions to demonstrate understanding of details in a text.	Attend to object characteristics 10/2/14	Identify familiar people, objects, places and events	Answer who and what questions and identify details in a familiar story	Answer who and what about story details	Answer who, what and where questions about story details
	RL.3.2	Associate details with events in stories from diverse cultures.	Seek absent objects 10/12/14	Identify familiar people, objects, places and events	Associate details with events in a familiar story	Associate details with events in diverse stories	Recount diverse stories with key details
	RL.3.3	Identify the feelings of characters in a story.	Identify feeling states in self	Identify feeling words 11/7/14	Identify the feelings of characters in familiar stories	Identify the feelings of characters in a story	Identify character feelings and relate to actions
	RL.3.5	Determine the beginning, middle and end of a	Express interest in a book sharing	Differentiate between text	Identify details and beginning and	Determine the beginning, middle and end of a familiar	Identify beginning and

学习三要素
The Learning Triangle

课程
Curriculum

教学
Instruction

测验
Assessment

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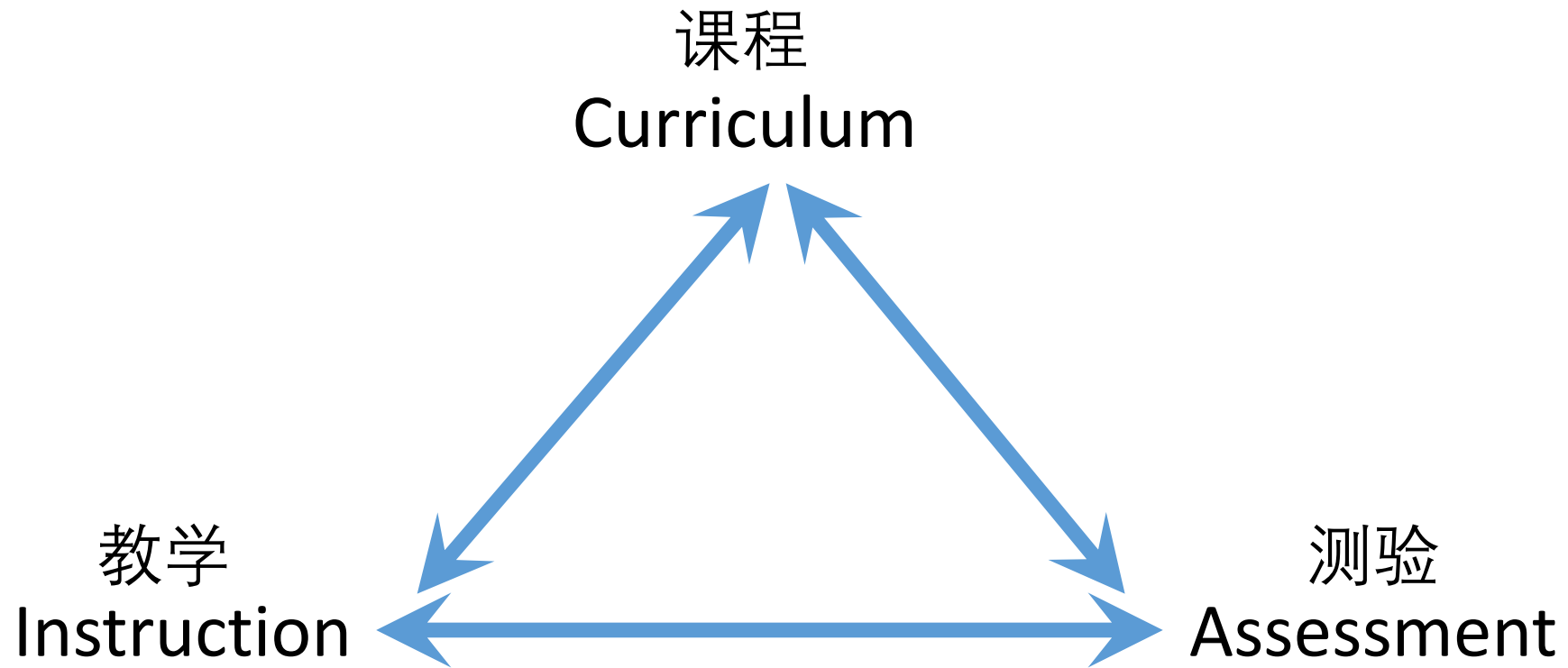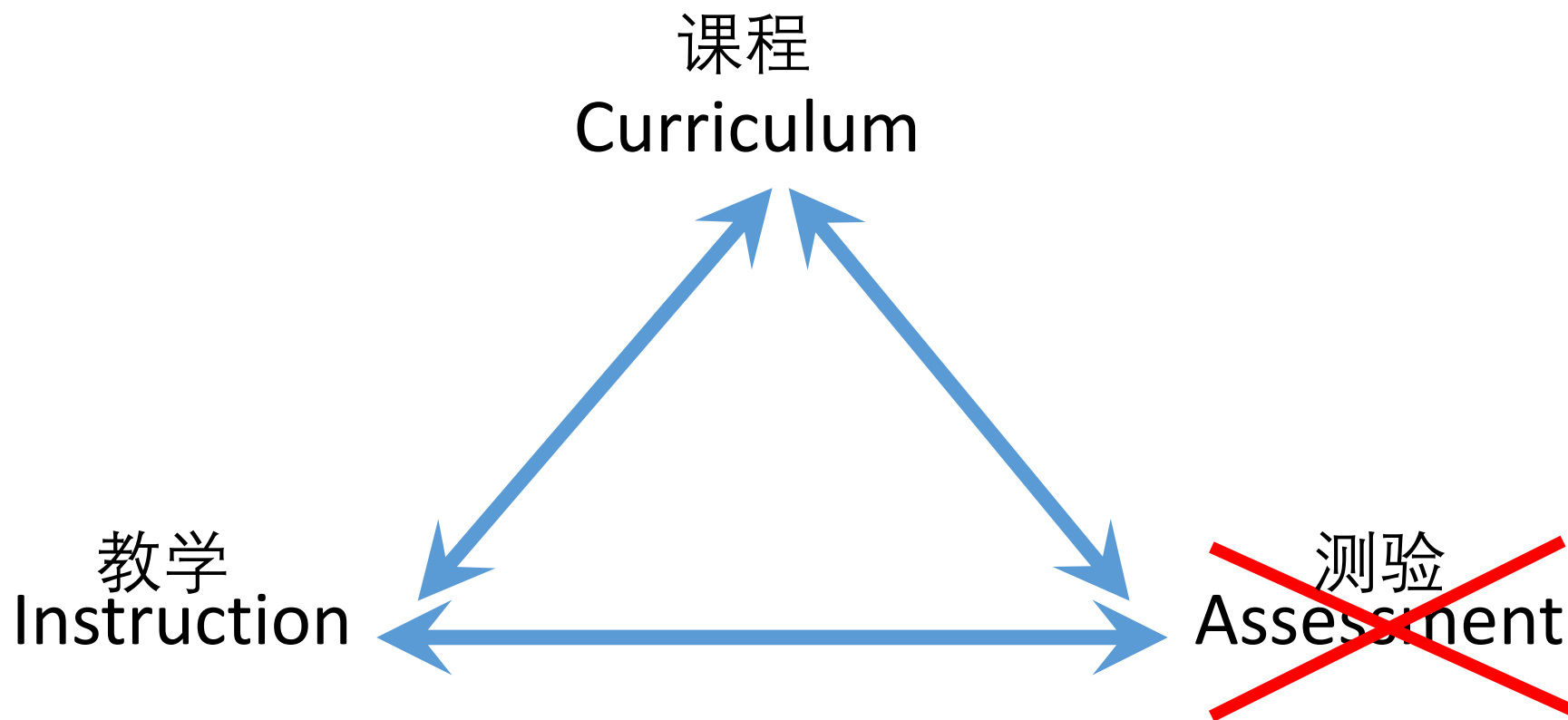
Possible Goals and Timing for Instructionally Useful Assessment

Goals	Timing
Set expectations for students	Administer right before instruction
Student self-correction of misconceptions	Administer before completion of instruction
Provide teachers feedback so they can improve instruction for current students	Administer before completion of instruction
Provide teachers feedback so they can improve instruction for future students	Administer at completion of instruction

有助于教学的测评目标及时间表

目标	时间安排
设定对学生的期望	即将进行教学活动之前
学生对误解的自我纠正	教学活动结束之前
为教师提供反馈来促进当前教学	教学活动结束之前
为教师提供反馈来促进今后教学	教学活动结束时

Hattie and Timperley (2007) Feedback model

Purpose
To reduce discrepancies between current understandings/performance and a desired goal

The discrepancy can be reduced by:
Students
- Increased effort and employment of more effective strategies *OR*
- Abandoning, blurring, or lowering the goals

Teachers
- Providing appropriate challenging and specific goals
- Assisting students to reach them through effective learning strategies and feedback

Effective feedback answers three questions

Where am I going? (the goals)	Feed Up
How am I going?	Feed Back
Where to next?	Feed Forward

Each feedback question works at four levels:

Task level	**Process level**	**Self-regulation level**	**Self level**
How well tasks are understood/performed	The main process needed to understand/perform tasks	Self-monitoring, directing, and regulating of actions	Personal evaluations and affect (usually positive) about the learner

Effective feedback answers three questions

Where am I going? (the goals)   Feed Up

How am I going?   Feed Back

Where to next?   Feed Forward
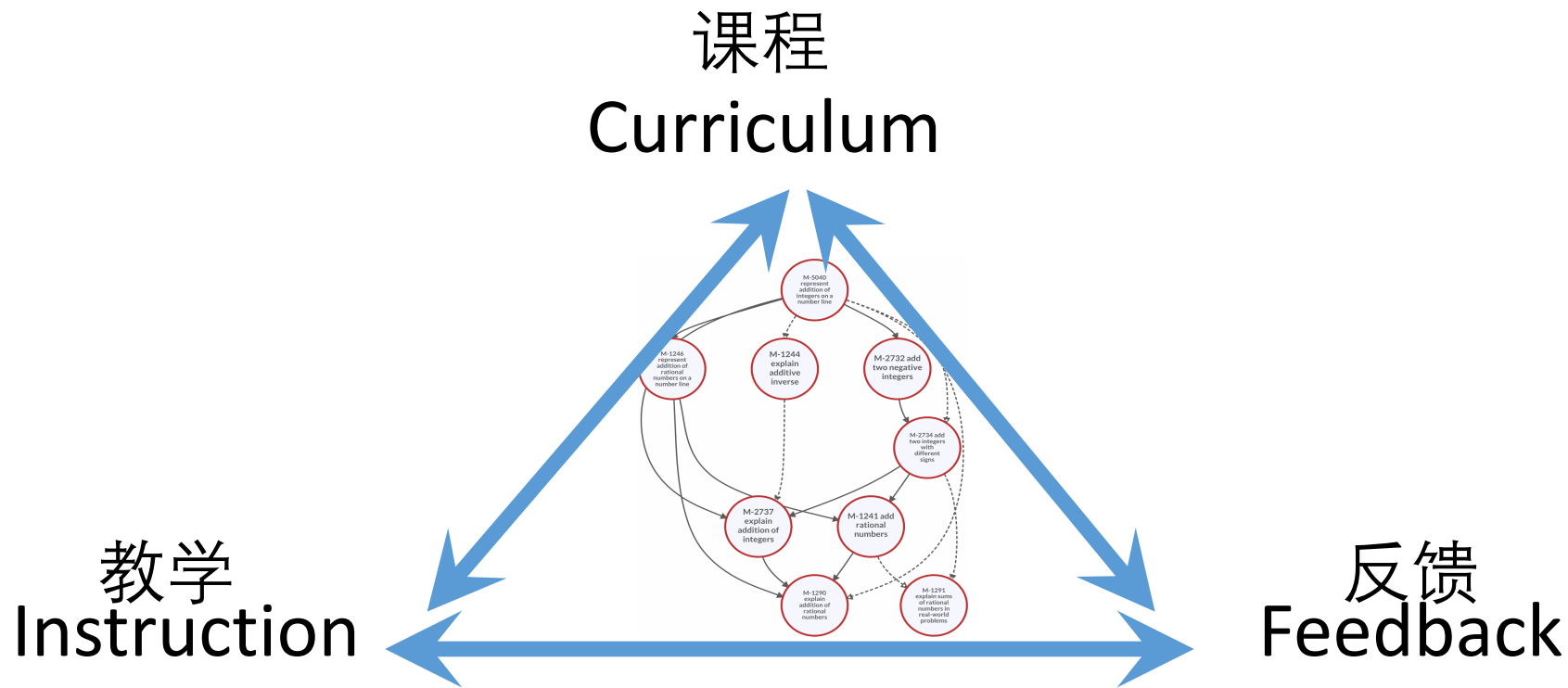
有效的反馈可以回答以下三个问题：
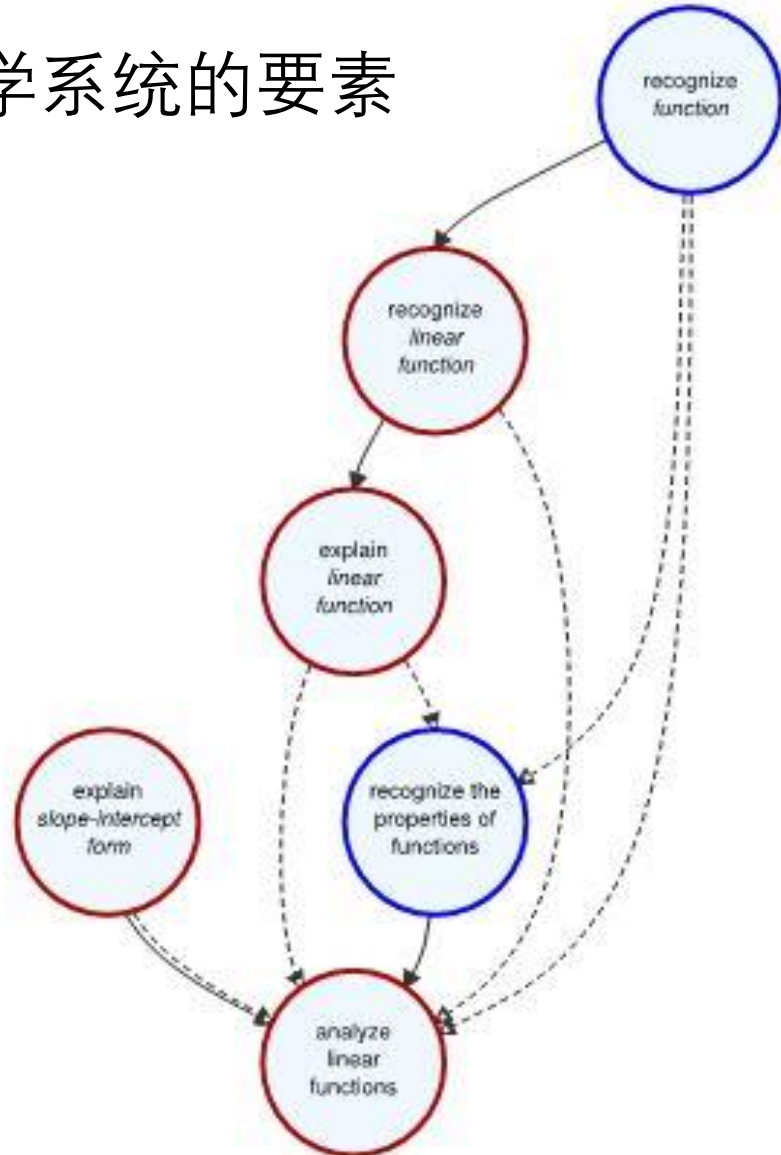
我的教学目标是什么?   信息输出

我的教学活动进行得如何?   信息反馈

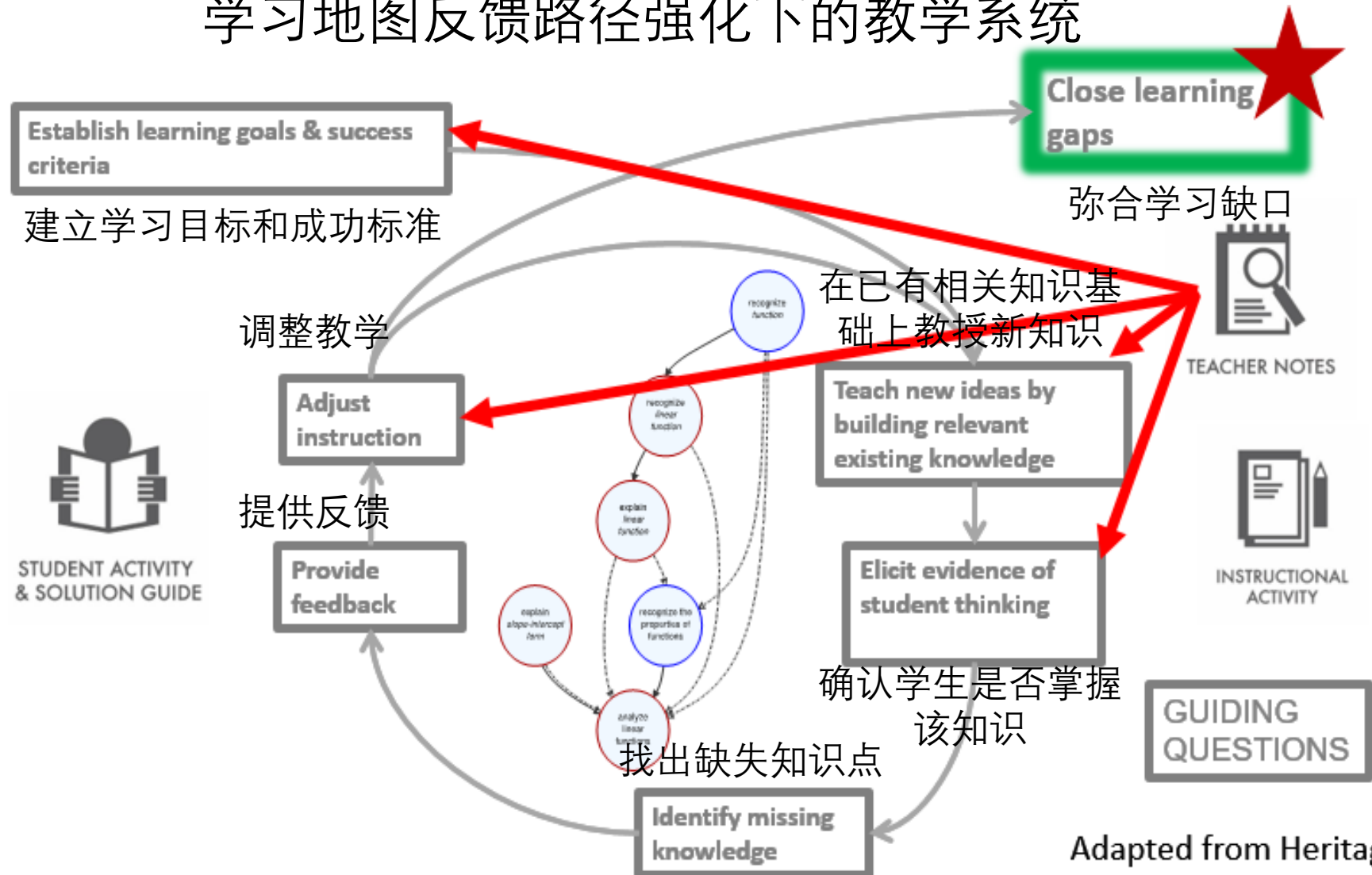下一步是什么?   信息传递

学习三要素
The Learning Triangle

课程
Curriculum

教学
Instruction

反馈
Feedback

Elements of an informed instruction system

知情教学系统的要素

教师教纲

教学活动

指导性问题

学生活动和题解

Informed instruction system with Enhanced Learning Map feedback loops

学习地图反馈路径强化下的教学系统

Establish learning goals & success criteria

建立学习目标和成功标准

Close learning gaps

弥合学习缺口

在已有相关知识基础上教授新知识

调整教学

Adjust instruction

Teach new ideas by building relevant existing knowledge

TEACHER NOTES

提供反馈

Provide feedback

STUDENT ACTIVITY & SOLUTION GUIDE

Elicit evidence of student thinking

INSTRUCTIONAL ACTIVITY

确认学生是否掌握该知识

找出缺失知识点

Identify missing knowledge

GUIDING QUESTIONS

Adapted from Heritage, 2010

Questions or Comments?

问答与讨论

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